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Library of Congress Cataloging in Publication Data

Brugge, David M.
Tsegai : an archeological ethnohistory of the
Chaco region.

Bibliography: p.
Includes index.
Supt. of Docs. no.: I 29.59:18C
1. Navajo Indians--Antiquities. 2. Navajo Indians--History. 3. Indians of North America--New Mexico--Chaco Canyon Region--Antiquities. 4. Indians of North America--New Mexico--Chaco Canyon Region--History. 5. Chaco Canyon Region (N.M.)--Antiquities. 6. New Mexico--Antiquities. I. United States. National Park Service. II. Title.
E99.N3B75 1985 978.9'82 84-600341

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TSEGAI:

An Archeological Ethnohistory of The Chaco Region

David M. Brugge

U.S.Department of the Interior
National Park Service

1986

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Washington, D.C. 20402

Preface

This report on the Navajo archeology of the Chaco region was planned as the final major contribution deriving from the Navajo studies conducted by the Division of Chaco Research. There is some work not finished as this is written. Whether it will see print before or after this is an imponderable, but it cannot be taken into account in my final summation in Part III, Concluding Remarks. Part III will have to stand as the primary effort at synthesis of the Navajo studies accomplished under the project. It does not pretend to provide a definitive statement of all the Navajo past in that region. There are too many questions yet unanswered for such a statement.

Most important still is the need to identify with certainty the archeological traces of Navajo presence prior to the Spanish Reconquest of New Mexico, 1692–1700. Although the Museum of New Mexico attempted to define a "Dinetah Phase" for this early period in the Navajo Reservoir district (Dittert, Hester, and Eddy 1961:245–46), the fact that the proposed phase was based largely on negative evidence and physical remains of uncertain significance led to relegating it to a status somewhat comparable to the hypothetical Basketmaker I of the Pecos Classification in the final report (Eddy, 1966). We have done no better in the Chaco work. The early remains of the camps of the first Apaches de Nabaxó have probably been noted in various archeological surveys, but if so, they have gone unrecognized for what they are. Until we do learn to distinguish these remains, the earlier phases of Apachean settlement on the Colorado Plateau will be known only from the accounts of the early Spanish explorers and colonists.

While numerous tree-ring dates extending back as far as the 14th century have now been processed from Apachean sites, no good clusters of dates or real cutting dates are yet known prior to 1694, and these are from a small Pueblo-style structure (Wilson and Warren, 1974).

We know from historic records that the Navajos were present in New Mexico in some numbers in the 16th and 17th centuries. The failure to find their settlements suggests that they produced an insubstantial architecture and little or no pottery. These are the kinds of evidence of greatest interest to most southwestern archeologists. Our failure to discover the sites of any group that erected structures which would leave easily recognized ruins, and that fired clay to produce its containers, seems rather improbable after the amount of survey that has been completed. Perhaps we have been looking in the wrong places. I expect that we will find, once the sites have been recognized, that they are more like those of the Archaic period, however, which predate the introduction of ceramics to the Southwest.

The many new techniques of dating that are coming into use give hope that the void will be filled ultimately by the simple process of temporal placement. Until this is done, however, our inferences as to the nature of the sites must remain highly speculative and our estimates of the time of arrival of Athabaskans west of the Rio Grande extremely uncertain.

During the period for which we do have archeological data, the most persistent theme in Navajo culture has been that of change and adaptation to those new circumstances experienced by any tribal people residing as neighbors of Euro-Americans. The stark realities of gunpowder, smallpox, highly disciplined military forces, and evangelistic religions have implications as profound for an indigenous culture as does any aspect of the natural environment. A tribe that could survive the impact of these phenomena also found opportunities for cultural growth, however, and for incorporating from the cultural inventory of the newcomers much that could aid in meeting the challenges presented.

The investigation of the archeology of a tribe during periods of contact with Euro-Americans must take into account the documented history of the times and, if it exists, the results of ethnographic studies of the tribe's culture. The relatively young field of ethnohistory provides the means for studying these data and supplies us with insights into cultural complexities that are as yet undefined in prehistoric eras. In the light of the ethnohistoric view, the relatively small and simple sites of Navajo extended families can be seen as the evidence that can help us gain a better understanding of a remarkably diverse series of developments. Whether we call the approach ethnoarcheology, historical archeology, or archeological ethnohistory, the latter term being my own preference, or simply do it as another variant of anthropological research, the potentials for learning more about the history of the human species and the processes that mold our cultures and societies over extended periods of time are great. In theory, at least, Navajo archeology can encapsulate over a span of a few centuries the most significant changes that have taken place in the millenia of human history, including the beginnings of agriculture, of pastoralism, of metallurgy, of the use of beasts of burden, wheeled vehicles, money, alcohol, and many other innovations. This sequence is duplicated by many other Indian tribes in North America, resulting in a potential for comparisons of some magnitude. By emphasizing those changes which have taken place largely by means of diffusion, I do not intend to denigrate the importance of the search for information regarding the ultimate origins of these phenomena. The fact remains, however, that they have originated in relatively few places. The origins are extremely significant, but as a part of the history of any particular society, they are usually secondary. The manner of introduction and integration of these traits into a culture has more relevance for an understanding of their roles in overall human history.

We can trace the elaboration of material culture among the Navajos in considerable detail, sometimes in such detail that it has proven to be embarassing to some members of the tribe. We have been less successful in delineating the history of their nonmaterial culture, of their social developments, and of the processes by which these took place. Those of us more interested in the material culture have been content to use as ethnographic analogy the findings of ethnographers, and ethnographers have been prone to quote archeological inferences, leading to a kind of circular feedback situation that does not lead to any real advances in knowledge.

The tendency of anthropologists to discount as inaccurate the historic documentation that is at variance with theoretical reconstructions has finally been overcome (Dobyns, 1966). While we must still remain aware of the weaknesses inherent in documentary data, we have learned to value the firsthand observations that archival sources supply and to make more serious evaluations of their significance. A more careful distinction between general anthropological theory and the application of theory to specific situations is helpful. One method of accomplishing this is the statistical analysis of such archival data as lends itself to this sort of study.

Another is the comparison of documentary data with archeological data, the major emphasis of the present work.

I am an "old archeologist" in my approach to the material, but I can easily recognize the potential of some of the ideas of the "new archeologists." I acknowledge my lack of skill in the advanced statistical techniques they apply and have not tried to indulge in analyses that I might not fully understand. I have applied, in an elementary fashion, some of their more general concepts, but will leave efforts to test my interpretations in a more rigorous manner to those competent to do so. Their techniques can be valuable, but only if the right assumptions are made as a basis for analysis and the right questions are asked of the data. I hope that the materials presented herein will help future workers to avoid some of the less promising approaches and to ask questions of their data that will most likely provide valid answers.

I myself have not been reticent about formulating speculative interpretations, but have tried to identify what is fact and what is fancy. Any attempt to integrate information from differing disciplines encounters difficulties in comparability of data, sometimes on the order of trying to relate mastodons to megaliths. My solutions have not been unique or exceptionally innovative, but I do hope that this crossing of the humanities and the sciences will find acceptance as having produced a product with some hybrid vigor, and if it does not qualify as archeology in a strict sense, that it will at least make it as good anthropology.

In my striving to hybridize the various scholarly fields, I have had the opportunity to receive advice, assistance and moral support from many others of diverse backgrounds.

Most important have been the Navajo people themselves of the Pueblo Pintado, Nageezi, and Lake Valley Chapters. Officers of these chapters whose official hospitality at their meetings made the work outside the monument boundaries possible include Councilman John Nez Beyal, President Edward C. Chee, Vice-President Gilbert Cayadito and Secretary Rose M. Trujillo of Pueblo Pintado; Vice-President Mary Jane Harrison of Nageezi; and President Hoskie Juan, President John Sandoval and Vice-President Richard Beyal of Lake Valley.

In addition to those who aided in an official capacity, many of the local people assisted by giving directions, guiding me to sites, supplying information, translating, repairing an ailing GSA vehicle and even inviting me to lunch. Among those whom I can recognize by name are Mr. Woody Antone, Mrs. Alfredo Cayadito, Mr. Jerry Cayadito, Mr. Andrew Charlie, Mr. Joe Cly, Mr. Tom Chischilly, Mr. John Largo, Mr. Frank Pablo, Mr. Ben Padilla, Mr. Charlie Padilla, Mr. Arthur Sandoval, Mr. Archie Werito, Mr. Cecil Werito, Mr. Bruce Yazzie and Rev. Kee Tso Yazzie. There are others whose English names I am unable to give, but to whom I am grateful for various favors. Three men were especially able guides for many days in the field and deserve special recognition. They are Mr. Alfredo Cayadito, Mr. Willie George, and Mr. Willie Norberto. Mr. Vernon Morgan, of Ganado, Arizona, was an able interpreter and field assistant during the early part of the work, and Mr. Jimmie K. Lopez served in a similar capacity the latter portion of the 1974 season. For expediting permits and for the permission itself, I must thank Chairman Peter McDonald and his staff, Mr. Martin A. Link and Mr. J. Lee Correll. I was not able to interview all those whom I wished, some because I did not find them at home and some because the time and money ran out. I do not have a full traditional Navajo history of the region at present, but have been able to take Navajo views into account. There is, of course, no single "Navajo view" any more than all whites are in agreement. In spite of the limitations of the interviewing, I hope that I have comprehended some of the variety of Navajo opinion without injustice to what I may have missed.

Those employed in the excavations during the 1975 field season included Mr. John D. Schelberg as field assistant, Mr. Jimmie K. Lopez, Mr. Earl Neller, Mr. Jake Trujillo, Miss Nancy Akins, Mr. Ben Etsittie, and Mr. Alvin Dennison. Volunteering time were Mr. Mac Foremen, Miss Teresa Vigil, Steven P. Brugge, Sam Walling, Jr., and Jay Judge. Laboratory processing of specimens in the field was accomplished by Miss Cathy Cameron, Mr. Robert Greenlee, Miss Jean Hooten, Miss Vickie Atkins, and Jay Judge. Remote-sensing mapping of the site by Dr. Thomas Lyons, Dr. W. James Judge, and Mr. Bruce Yazzie improved my site mapping significantly.

Fieldwork in ethnoscience by Mr. Dennis Fransted, Mr. Terry Noonan, Mr. David Greenburg, Mr. Richard Levine, and Mr. Wesley Begay under the direction of Dr. Oswald Werner was done cooperatively with my own work and added greatly to my depth of understanding of the local communities. Mr. Robert W. Young gave additional help with Navajo phrases and names.

Mr. Thomas W. Mathews and Mr. William B. Gillespie identified the faunal remains recovered during the 1974 and 1975 seasons respectively. Dr. Lewis R. Binford allowed us to refer to his and Jack B. Bertram's (1977) excellent analysis of bone frequencies in prepublication form. Dr. Loren D. Potter, Miss Molly Struever, and Mrs. Anne Cully assisted with botanical identifications of specimens and in field observations. Dr. Richard I. Ford, University of Michigan, provided identification of a peach seed. Mrs. A. Helene Warren gave invaluable help in mineral identifications and ceramic studies. Euro-American trade goods were identified by Miss Emily K. Abbink.

For aid in locating historical sources, I am especially indebted to Mr. J. Lee Correll of the Navajo Tribe, but wish also to thank Dr. Myra Ellen Jenkins of the State Archives of New Mexico, Miss Mary Lu Moore, formerly of Special Collections, University of New Mexico, Mrs. Mary J. Blumenthal of the same institution and Dr. Eleanor Adams. Mr. Edward O. Plummer of the Eastern Navajo Agency and his staff provided access to Bureau of Indian Affairs files in their offices, and Mr. Victor Cartwright and his staff of the Southwest Title Plant in Albuquerque were equally cooperative. The Santa Fe office of the Bureau of Land Management was also very helpful in my efforts to run down materials relating to early cadastral surveys in the Chaco region.

In addition to the many Navajos who helped provide oral history, I wish to acknowledge the willingness of Mr. G.H. Lobato, Mr. Albert Hutton, Mr. John Arrington, and Mrs. James G. Marsh to grant interviews. Mr. Horace Boardman also responded very graciously by correspondence to my request for further details on his family's trading operations in the Chaco region. Dr. Leland C. Wyman was especially generous with information and materials relating to the ethnographic field schools of the University of New Mexico which were under his direction from 1940 through 1942.

Many others currently working in Navajo archeology or various other kinds of research in the eastern Navajo country have been willing to provide information, discuss problems and share ideas which have contributed in one way or another to my own research. As might be expected, I owe much to all the people who have worked on the Chico project, but must especially mention Dr. Robert H. Lister, Dr. W. James Judge, Dr. Thomas R. Lyons, Mr. Thomas W. Mathews, Mr. Thomas Windes, Miss Marcia Truell, and Mr. Peter J. McKenna. Mr. Albert E. Ward has cooperated regularly in comparing data from his work in the region, first while with the Office of Contract Archeology, and later with the Museum of Albuquerque and the Center for Anthropological Studies. Mr. Donal Phibbs led me to one very significant Navajo site which undoubtedly would otherwise have been missed. Mr. David Barde and Mrs. Klara Kelly were very helpful in research into trading post history. The staff at Chaco Culture National Historical Park has given generous support to the work. Superintendent and Mrs. Walter P. Herriman, Mr. and Mrs. James R. Mount, Mr. and Mrs. Foreman and Mr. and Mrs. William T. Nichols require special mention. I am indebted to Dr. David L. deHarport for conceptual leads given long before this project began which have influenced my approach to the analysis. In rock art studies, I must acknowledge the contribution of Col. James G. Bain, Miss Jane Kolber, and Mr. Clair Cochran. Mr. Gary Lister has assisted with photography. Mr. Jerry Livingston's drafting and art work require special acknowledgement for their contribution to the finished product. Typing has been done by Rosemary Ames, an unenviable chore in view of my handwriting. Orthography of Navajo words has been standardized with Young and Morgan (1980). Editing was done by Douglas L. Caldwell. Despite the length of this list, I am sure that I have omitted some who deserve recognition and hope that any left out will forgive me my faulty memory. I fully appreciate all that has been done and hope that the results will not be found inadequate. My final thanks must be reserved for my wife and children for their acceptance of my extended absences and other inconveniences occasioned by the job I undertook.

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Historical Introduction

Tsegai, a contraction of *tse*, "rock," and *łigai*, "white," is the Navajo name that was Hispanicized as *Chaca*, possibly passing through some Pueblo language to Spanish. *Chaca* in turn was Anglicized as Chaco and Chacra. All refer to the same general region, but except for the English Chaco, pertain more to Chacra Mesa than to Chaco Canyon. *Tsegai* is a word that can connote "home" to some Navajos, in particular to those whose ancestors left most of the remains reported on in this monograph.

A separate paper (Brugge, 1980) presents their history as documented in archival sources. A brief summary of this history here will assist readers who do not have ready access to the fuller account.

We do not really know when the first Athabaskan migrants left their homes in the forests of what is now western Canada to move southward, nor when some of them finally arrived in the Southwest. The early Spanish colonists of the 16th and 17th centuries called them Apaches, and those directly west of the Rio Grande Pueblos, they named *Apaches de Navajó*. The latter differed sufficiently from their Apache cousins so that they came to be called merely *Navajoses* by the time of the Mexican War. But even today, Spanish usage in New Mexico is variable, and they are still considered Apaches by some.

Throughout the 17th century, Spanish relations with the Apacheans varied from peace to war as different governors of New Mexico adopted different policies toward them. The Apacheans, in their turn, alternately attracted by the prospect of obtaining new and useful goods, domestic animals, crops and religious ceremonies, and repelled by the threat of domination by their powerful new neighbors, vacillated in their dealings with the Spaniards. As they watched the Pueblos submit to a harsh foreign rule, they learned to be wary of commitments that might be too binding.

In 1680, when the Pueblos united and drove out their conquerors, the Apachean peoples were firmly on the rebels' side. The Pueblos again surrendered to the Spaniards in the 1690's, having lost their unity. Nominal submission was given in 1692, but is was not until the following year that the colonists and missionaries returned to stay. Pueblo factionalism had made possible their return, but also ensured that ruling the colony would not be easy. Several decisive defeats suffered by those still willing to resist the invaders caused many refugees to flee to escape punishment. A large number of the refugees settled in Navajo country along the upper San Juan River and such tributaries as Los Pinos, Largo, Gobernador and Frances Canyons. They brought with them not only their own cultural heritage to add to the ways of their hosts, but a great deal of knowledge gained from their former rulers. The result was the growth of a new way of life in the region in which they settled, an area that came to be called the *Dinetah*, "Among the Navajos."

Within a generation or so, the descendants of these culturally and racially mixed peoples of the Dinetah began to expand their settlements. An early movement of pioneers of this new lifeway probably reached Chacra Mesa by 1720, or shortly thereafter. Whether they met other Navajos already there living a more Apachean lifeway is not known. By the end of the decade, however, a Chacra Mesa band or community can be safely postulated as being in existence.

The Chacra people shared in the general fortunes of the tribe, but were seldom identified by early chroniclers. We must rely largely upon tribal history to infer what they experienced during these early years.

The wars between the Navajos and the Spaniards ended about 1716, leaving the settlers of the Chacra ample opportunity to establish themselves in peace. While Ute and Comanche raiders plagued the Dinetah, the newer and poorer Navajo settlements to the south were apparently spared. In the 1740's, encouraged by a long period of peace, Spanish missionaires began efforts to convert the tribe. Even they paid no attention to the Chacra country. Not until Spanish colonists began to penetrate the upper valley of the Rio Puerco of the East in the 1760's is it likely that any close contact developed between this small band and the whites.

It is highly probable that it was this Spanish expansion that was at the root of the war that began in 1774. The Navajos forced the Spaniards to abandon the many settlements along the Puerco and most of those around Mount Taylor. Spanish troops probably made an incursion into the Chaco region during the war, for shortly afterward, the name *"Chaca"* first appears on maps.

Despite repeated Spanish efforts to cement an alliance in succeeding years to enlist the Jicarilla Apaches, Utes, Comanches, and Navajos in their wars against the southern Apaches, the inherent conflict over land that existed between neighbors, all of whom needed fields to plant and pasturage for livestock, seemed almost inevitably to lead to more wars and then still more wars. By the time of Mexican Independence in 1821, neither side dared trust the promises of the other. A trade in Navajo captives developed under Mexican rule that added rapidly to the forces driving the escalating hostilities.

When the United States conquered New Mexico in 1846, there were few who could remember a time when the Navajos and New Mexicans had enjoyed mutual peace free of discord. The establishment of Fort Defiance in 1851 brought only a brief respite. In 1858, the wars began anew. By the end of 1864, the Navajos were a beaten tribe. Over 8,500 of their people were taken in exile on the Long Walk to captivity at eastern New Mexico's Fort Sumner on the Pecos River. Others, whose numbers will never be known with certainty, having lost most of their property, sought refuge in the more distant parts of Navajo country and even among neighboring tribes.

In June, 1868, a final treaty was signed by the tribal headmen and the Navajos were allowed to return to their homeland. Only a fraction of their former range was given to them as a reservation. The Chaco country was not included. Lying between the westernmost settlements of New Mexico and the eastern boundary of the reservation, it soon became an arena of new conflict between Navajos and whites.

As Navajos straggled back to reestablish themselves, resettling lands laid waste by the wars, wealthy stockmen in New Mexico began to send their herds westward. Anglo cowboys, New Mexican sheepherders and Navajo settlers were soon contending for a vast expanse of public domain. Chaco Canyon was very nearly at the center of this tract, almost on the edge of a grant of alternate sections granted by the government to what was to become the Santa Fe Railway. For many years, there was no effective political control of the area. County sheriffs on the east had little desire to become involved; the Navajo Agency at Fort Defiance was too distant, overworked, and understaffed to do more than write letters and send an occasional messenger; the railroad had other more profitable interests; and the Army was busy with the Apache wars.

In spite of their recent defeat, the Navajos had the will to try to hold their own. Several enterprising families built up large herds of stock and were able to serve as buffers against the pressures from outside for their less fortunate fellows. Navajo wealth attracted traders who, initially at least, were willing to lend support to their customers' need for pasturage. More influential, perhaps, were the Army officers who wanted to recruit Navajo youths to serve as scouts in the Apache campaigns.

Richard Wetherill, with the financial backing of the Hyde brothers, began excavations in the Chaco ruins in 1896 and started a trading post in 1897. He relied largely on Navajo labor for his archeological work and Navajo customers for his store, but began to branch out into ranching himself. By 1909, when the government sent S. F. Stacher to oversee the affairs of the eastern Navajos, Wetherill was actively competing with his customers for range. In 1910, *Chiishch'ilíni' Biye'* shot Wetherill to avenge the supposed death of a kinsman. Within a few years, Edward Sargent, a wealthy stockman of Chama, New Mexico, had gained control of the Wetherill interest and became the major, but not the only, white competitor for lands in the immediate Chaco region.

Stacher, who served 26 years as head of the Pueblo Bonito Superintendency, or Eastern Navajo Agency as it was later called, began the first Indian school at Crownpoint, initiated programs to improve Navajo sheep by breeding with imported varieties and to protect them from disease by dipping, sponsored an allotment project which gave many individual Navajos titles to at least small tracts of their homeland, helped the Navajos who could afford it to lease railroad lands, sponsored the election of community headmen and judges and the organization of formal chapters as community governing units, and helped promote a host of other innovations. Toward the end of his career, he worked to obtain veterans' pensions for many older Navajos who had served as scouts in the Apache campaigns. Often at odds with all other whites in the region because of his staunch support of Navajo rights to the land, and sometimes with Navajo leaders as well when he was forced to compromise in order to hold any lands for the Indians, his career ended with the land problem still unsolved amid the bitterness of the stock reduction undertaken by John Collier, Commissioner of Indian Affairs.

One of Stacher's Navajo proteges, Jacob C. Morgan, became Collier's most forceful opponent in tribal politics. The dissatisfactions engendered by a diminishing land base and a growing population, while leading to a few incipient nativistic phenomena, quickly coalesced behind Morgan's leadership. Morgan was unable to stop stock reduction, but he did bring about the defeat of Collier's pet project among the Navajos, establishment of the tribal government under the Indian Reorganization Act.

World War II brought relief of a temporary sort. Hundreds of Navajos left to work in defense industry and to enlist or be drafted into the armed forces. The money they sent home did more than just supplement the meager incomes of those dependent on herds and dry farming. When the war ended, economic disaster struck. Only emergency government assistance and seasonal jobs prevented a complete collapse.

Tribal purchase of many of the ranches established by whites has brought increased Navajo control of the eastern Navajo country. Increased education has made it possible for many Navajos today to find jobs in cities and towns where they do not have to depend entirely on the resources of the land or the sporadic employment opportunities offered by the government, traders, and archeologists. Among the Navajos now living in distant urban centers, however, there are not a few who still think of *Tsegai* as home, who would much prefer to butcher a sheep each week to cashing a pay check at a store, if such a life were still possible.

The changes in life in the Chaco region since 1720 have been great. The Navajos of the early 18th century already practiced agriculture and animal husbandry, had mastered the techniques of ceramic and textile arts, and had encountered firearms if they did not yet possess them. Their descendants had to learn to deal with alcohol, money and credit and wage work, wheeled vehicles, new religious ideologies, the need for a strong political organization, writing and radio and television, fences and jails, and laws made by others. Archeology can tell a little about some of these changes.

Interest in Navajo archeology of the Chaco region was slow to develop. It was not until 1937 that a survey of Navajo remains was undertaken. This first survey was done by Roy L. Malcolm as a student of the University of New Mexico field school of that year. His published report, "Archaeological Remains, Supposedly Navaho, from Chaco Canyon, New Mexico," appeared in *American Antiquity* (1939). The field notes of this survey have not been found, nor have the collections, aside from a few items in the Peabody Museum at Cambridge.

Following this, interest seems to have lapsed. Gordon Vivian excavated at least some of the Navajo structures built on Una Vida Ruin, but no notes have been found, and even the date of his work is unknown. Vivian (1957) also reported on a cache of Navajo baskets and pottery found in the Chaco region in 1957.

In the 1950's, the Navajo Land Claim did some survey work outside the Chaco Monument boundaries, mostly on Chacra Mesa. About the same time, 1957-58, R. Gwinn Vivian conducted surveys and did some excavation in Navajo sites, both within the National Monument and beyond on Chacra Mesa (Vivian, 1960). George Buckingham also recorded some of these sites in the Monument's survey files.

Again, there was a lapse in activity until the National Park Service's Chaco Center surveys began in 1971. These were intensive surveys of all sites, prehistoric and Navajo, but were largely restricted to lands within the Monument.

The present study is essentially an effort to gain insight into some aspects of Navajo life in the past that history does not provide, including any non-Navajo presence that might have influenced Navajo affairs.

Fieldwork began in the fall of 1973 with a brief trip to Chaco Canyon. After studying the Navajo data and collections of the Chaco Center's intensive survey within the Monument, I began the major part of the extensive survey reported in Part I herein. It was conducted in the summer of 1974, with a few sites being recorded at various times in 1975 and 1976. The excavations at the Doll House Site were undertaken in the summer of 1975. Throughout this period, I also engaged in archival research on the history of the area and writing up that history, as well as acting as curator for the National Park Service, first for the Navajo Lands Group and later for the Southwest Region.

During my two full field seasons, Dr. Oswald Werner, of Northwestern University, was principal investigator of ethnoscience research under contract with the National Park Service. In 1974, this work was done in the field under Dennis Fransted and was devoted largely to a study of Navajo place names. The 1975 work, directed by Richard Levine and concentrated on Navajo views of land, coincided in part with my own. It made possible a sharing of data, transportation, guides and informants and other cooperation which facilitated both the archeological and the ethnoscience research.

Analysis of the data and collections and writing were largely completed by the end of June, 1977, but a great deal of revising, editing and work on illustrations continued beyond that date. The final manuscript was submitted for publication in 1980.

The Extensive Survey

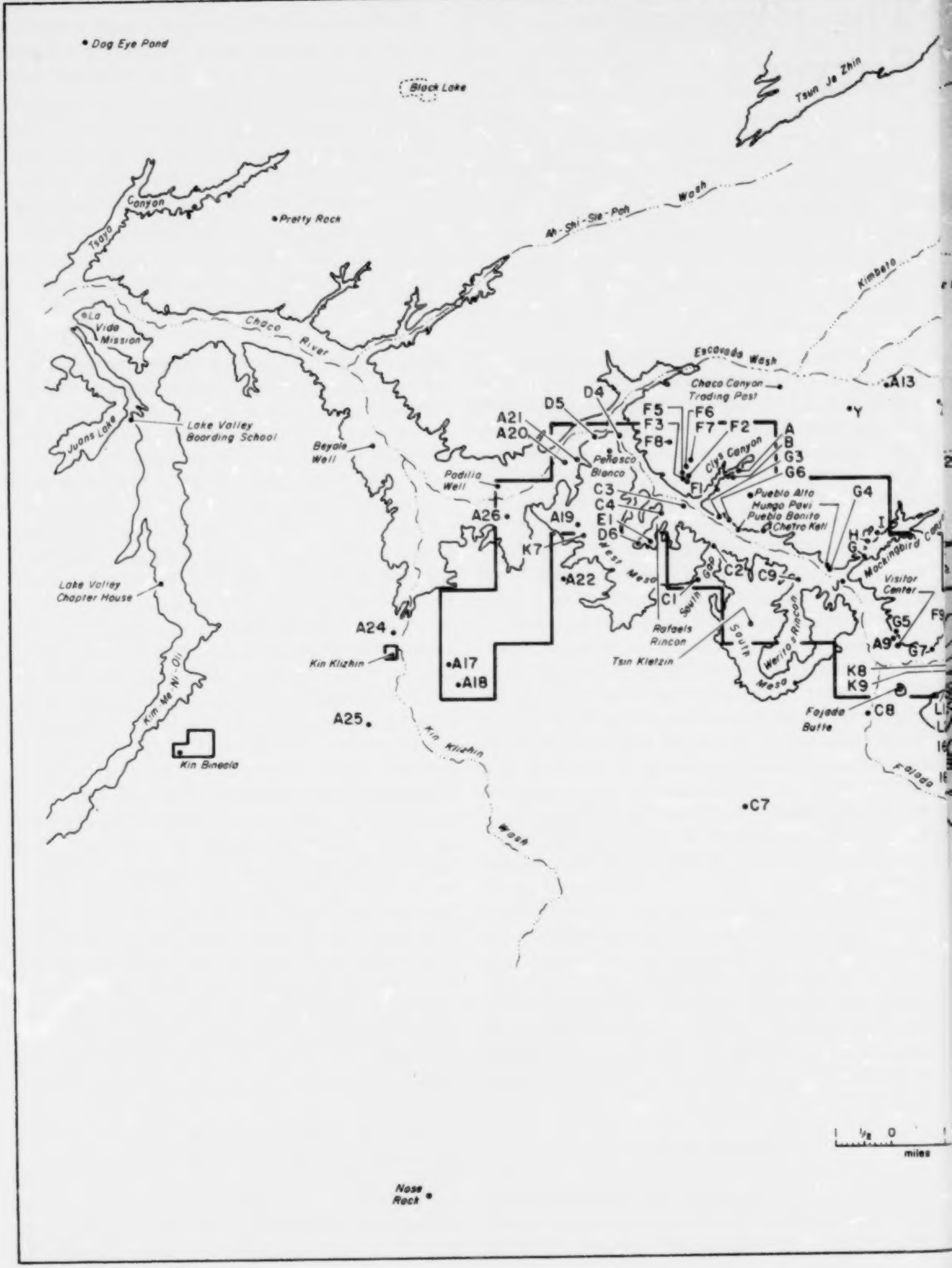
The extensive survey of historic sites was accomplished in 1973 and 1974 with a few additional sites being noted in 1975 and 1976. It was felt that a better knowledge of the country beyond the park boundaries was needed in order to understand the use made of the region by the peoples who had been present during the historic period. Initially, an area of 15 Townships, T's 20, 21 and 22N, R's 8, 9, 10, 11 and 12 W., was selected for investigation. This took in the major Chacoan outliers of Pueblo Pintado on the east and Kin Bineola on the west, providing a sample that was believed comparable to the territory most intensively utilized by the prehistoric population and best adapted for comparison with the earlier occupations. As the work progressed, we found that we had to go somewhat beyond these limits on the north and east in order to attain a fairly representative series of sites significant to the problem. Work in the western portion of the original sample area was not as full as that in the central and eastern portions.

The objective of the survey was to obtain as full a range of the types of sites representing the historic period as possible. Ascertaining relative frequencies of sites was not a primary objective. While the proportion of site types and features has been used in my analysis, it must be kept in mind that the frequencies are not based on a random sample and thus require further testing.

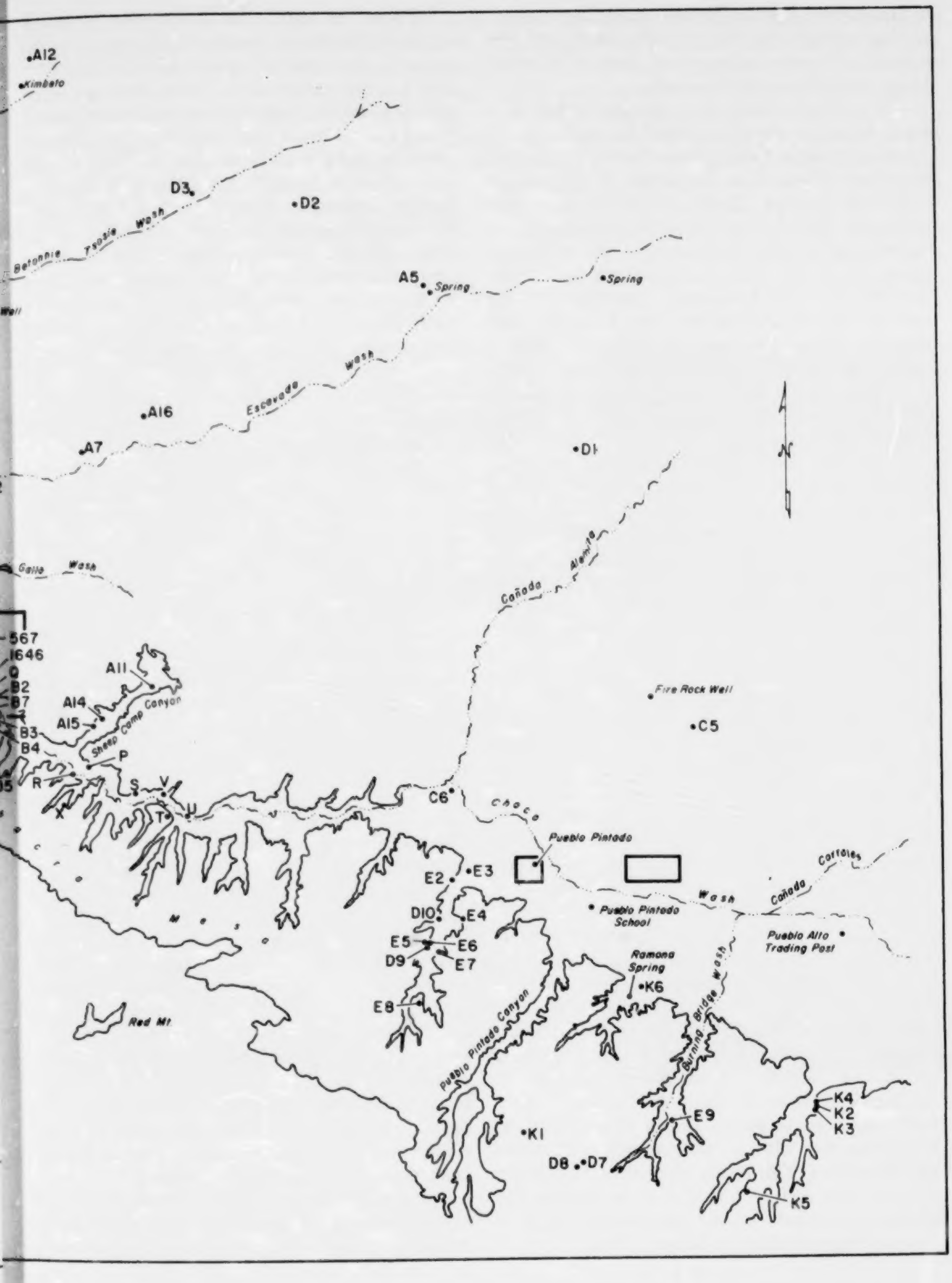
Geography

The country surveyed lies entirely within the drainage of the Chaco River which crosses it from near the southeast corner, flowing westerly and leaving near the northwest corner. In the southeast, Chacra Mesa (Navajo, *Tsé gai*, "White Rock") rises gradually to the southwest of the Chaco and parallel to it (fig. 1). The southwestern side of the mesa is a steep escarpment. Numerous small canyons drain the northeastern flank of the mesa, flowing into the Chaco. Only one of these cuts completely through the mesa, providing an easy passage to the rolling steppe country beyond from the Pueblo Pintado area. It is shown on recent maps as Pueblo Pintado Canyon and known locally among the Navajos as *Nahodeeshgizh*, "Long Gap" or "Long Canyon" (Fransted and Werner, 1975). The sheltered heads and rincons of the other canyons provide especially favorable environments, often containing springs or ground water near the surface as well as protection from excessive evaporation by wind and sun. The western tip of Chacra Mesa is steep on both sides and front. A relatively long opening between it and South Mesa, farther to the west, is broken only by Fajada Butte (Navajo, *Tsé Diyiní* or *Tsé Diyili*, "Holy Rock;" Fransted and Werner, 1975). South Mesa and West Mesa, separated by the relatively narrow South Gap (Navajo *Tsé Anii'ahi Bígiizh*, "Leaning Rock Gap," Fransted and Werner, probably after Threatening Rock), are both relatively steep on all sides and form the southern walls of the lower portion of Chaco Canyon.

Beyond West Mesa, the Chaco Valley is more open, flanked by smaller and more broken mesas on the south and with the cliffs on the north set back more from the stream bed. From this same point eastward, the cliffs on the north close in the canyon almost to Pueblo Pintado. To


Dog Eye Pond
Black Lake
Tsun Je Zhin
Tsaya Canyon
Pretty Rock
Ah-Shi-Sle-Pah Wash
Kimbeto
La Vida Mission
Chaco River
Escavada Wash
Chaco Canyon Trading Post
A13
Y
Juans Lake
Lake Valley Boarding School
Beyale Well
Padilla Well
D5
D4
A21
A20
F5
F3
F8
F6
F7
F2
A
B
G3
G6
Peñasco Blanco
Clys Canyon
F1
C3
C4
E1
D6
Pueblo Alto
Hungo Pavi
Pueblo Bonito
Chetro Ketl
G4
A26
A19
K7
A22
West Mesa
C2
C9
Gap
C1
South
I
H
G
Mockingbird Canyon
Visitor Center
F9
G5
A9
G7
Rafaels Rincon
Tsin Kletzin
South Mesa
Werito's Rincon
K8
K9
Fajada Butte
C8
Lake Valley Chapter House
A24
Kin Klizhin
A17
A18
A25
Kin Klizhin Wash
Kin-Me-Ni-Oli
Kin Bineola
C7
Fajada
½ 0
miles
Nose Rock

Map showing the Chaco area.


A12
Kimbeto
D3
D2
Betonnie Tsosie Wash
A5
Spring
Spring
Well
Escavada Wash
A16
A7
D1
Gallo Wash
Cañada Alemita
567
1646
Q
B2
B7
B3
B4
A11
A14
A15
Sheep Camp Canyon
P
R
S
V
T
U
X
Fire Rock Well
C5
C6
Chaco Wash
Pueblo Pintado
E2
E3
D10
E4
E5
E6
D9
E7
E8
Pueblo Pintado School
Cañada Cortales
Pueblo Alto Trading Post
Ramona Spring
K6
Red Mt.
Pueblo Pintado Canyon
Burning Bridge Wash
E9
K1
D8
D7
K4
K2
K3
K5

the east above Pueblo Pintado, the valley is open, rolling grasslands rising to the north and the somewhat more pronounced rise of Chacra Mesa bounding it on the south.

The Chaco River is a deeply incised dry wash from the eastern edge of the region to its junction with the Escavada at the western end of the West Mesa. The Escavada is the major tributary of the Chaco, entering from the northeast, but flowing generally westerly. Its valley is generally open and its bed wide and sandy as is the bed of the Chaco below its junction with the Escavada. Together with its two principal tributaries, the Kimbeto and Betonnie Tsosie Washes, which join it within a mile of each other, it drains a large area between the Chaco Canyon and the Blanco and Largo drainages to the northeast, Lybrooks being just outside the watershed.

The major northern tributaries of the Chaco in the Pueblo Pintado area are the Cañada Corrales and Cañada Alemita, the latter called *T'iis Shijaa'*, "A Few Standing Cottonwood Trees" in Navajo (Fransted and Werner, 1975). Entering the Chaco between these and the Escavada are several smaller drainages with well incised canyons in their lower portions. From east to west, they are Sheep Camp Canyon, Gallo Canyon, Mockingbird Canyon and Cly Canyon, the latter formerly known as Rincón del Camino. These are known in Navajo respectively as *Tsé Halgai*, "White Rock Place;" *Ndíshchíí' Haazt'i'*, "Where Pine Trees String Up and Out;" *Tsin T'éézh Yí'áhí* or *Tsin Łeeh Yí'áhí*, "Burnt (or Black) Trees Standing;" and *Ha'aatseli*, "Chipped Out;" (Fransted and Werner, 1975). Gallo Canyon has also been called Mockingbird Canyon and Una Vida Canyon (Hewett, 1936). Below the mouth of the Escavada, major tributaries from the north are Ah-she-sle-pah Wash, the name an Anglicized form of the Navajo *'Ashįįh Łibáhí*, "Gray Salt" (Ibid.), and Tsaya Canyon, from the Navajo name *Tséyaa*, "Under the Rock" (Ibid.). Ah-she-sle-pah Canyon is apparently that which is sometimes referred to as Meyers Canyon in certain older sources (Ibid., 1954). Judd (Ibid.) uses the Navajo name Tees-e-chin which he translates as "Many Cottonwoods." Fransted and Werner (1975) apply the name *T'iis Eejin Tó* and *T'iis Eejin Ch'ínílį́ni* to an area on the Chaco somewhat farther upstream, but note both as "approximate location" (Ibid.).

From the south, the Chaco receives many smaller tributaries, most of which head in the mesas, a complete listing of which would be too long for this description. Those that are listed here are limited to places where sites are known. From east to west, the first lacks an English name, but is known in Navajo as *'Ajichįį'*, a name having to do with defecation. The next, Burning Bridge Canyon, is known as *Tsé Łichíí'*, Red Rock, a spring near its head called *Tsé Łichii' Bítóó'*, "Red Rock Spring" (Ibid.). The canyon in which Ramona Spring is located has three Navajo names, *Tó Bi K'ihasbii'*, "Little Spring Made Bigger and Sheltered" at Ramona Spring (Ibid.), *Télii Habitiin*, "Donkey Trail," in its midportion (Ibid.) and *Daka Náastani*, no translation, near its head. This phenomenon is true of many canyons and water sources of any size, the Navajo names applying to very specific features but often being used loosely in an extensive sense. Pueblo Pintado Canyon is given above.

The two canyons between Pueblo Pintado Canyon and the upper end of Chaco Canyon are *Táchii'*, "Red Water," and *Jeeshóó'*, "Buzzard," neither having official English names. The many small canyons entering Chaco Canyon from the south also generally lack English names, and few of their Navajo names were determined in the field. That draining most of Section 9, T20N, R9W emerges into the main canyon just above a place known as *Ił Náshini*, "Dark Encircling Pinyons," and the smaller canyon immediately west enters Chaco Canyon at a location called *Łichii' Ndii'ahe*, "Red Slope." The branching canyon draining most of Section 6 in the same township is *Tsé Dook'ą́ą́łi*, "Burning Coal Canyon" (Ibid.). The canyon entering southeast of Wijiji has near its head a spring called *Náshdóí Bitoo*, "Wildcat's Spring" (Ibid.), but the name does not seem to apply to the rest of the canyon. Next to the west, however, the broad branching canyon entering directly south of Wijiji, has a spring called *To Dík'ǫ́ǫ́zhi*, "Salty (or Sour) Water" (Ibid.), a name that is applied in a broader sense to include at least the lower portion of the canyon. None of the other canyons on Chaco Mesa have been identified by name thus far, although some scattered names in the vicinity, as at Shabikeshchee, may help identify locales.

A major tributary, Fajada Wash, enters the canyon between Chacra Mesa and South Mesa, draining much of the country immediately south of the Chacra. It has also borne such names as Vicente Arroyo and South Fork of the Chaco. Weritos Rincon, which has cut out most of the east half of South Mesa, has the Navajo name of *Tsé Dah Łizhin Ch'ínílį́ni*, "Black Rocks Flowing Out" (Ibid.). The small canyon behind Casa Rinconada is known as *Tsékooh Yázhí*, "Small Canyon" (Ibid.).

West Mesa is drained by a larger number of small canyons. Only one, Rafael's Rincon, has a recognized English name, and none of the Navajo names have been determined. West from the mouth of Chaco Canyon, two larger drainages flow into the Chaco River. The first, Kin Klizhin Wash, has its headwaters about 12 miles south southeast on the former Pitt Ranch. Its upper basin consists of rolling hills and the lower portion, of extensive bentonitic clay formations. Farther west, Yellow Point Valley branches about four miles above its mouth, the west fork being known as Rock Point Valley, and the east as Kim-me-ni-oli Valley. This latter drainage is the larger and is joined by a tributary from the southeast, the Min-me-ni-oli

Excavated catch basin at Site B spring

Wash, near Kin Bineola Ruin. Just west of Yellow Point Valley is a small shallow lake, Juan's Lake. This is an artificial reservoir for irrigation water, but was probably originally a smaller ephemeral natural lake.

There are numerous small seeps and springs in the rincons and side canyons bordering Chaco Canyon. The seeps have frequently been improved by digging out catch basins where water accumulates slowly (fig. 2). One important spring is in the main channel at the junction of the Chaco River and the Escavada. At most places along the Escavada, water may be obtained by digging in the bed of the wash. These temporary wells would wash out with every heavy flow in the arroyo, but could be easily renewed. Before the use of windmills, they were long an important source of water for travelers and stockmen. In addition, natural potholes that hold runoff for varying periods following precipitation are to be found where erosion has cut its way over and through the exposed sandstone formations, especially along the edges of Chaco Canyon and on some of the upper ledges of Chacra Mesa.

Most of the country is grassland and is today used for grazing domestic livestock. This is broken by bentonitic badlands in various places, particularly along the Escavada and in the vicinity of lower Kin Klizhin Wash and westward. Pinyon-juniper woodland is found in the higher elevations. It is best developed on Chacra Mesa and increases in density toward Pueblo Pintado. There is rather sparse woodland to the northeast as well as along the upper portions of the Kimbeto and Betonnie Tsosie Washes. A great many minor ecologically distinctive vegetative associations occur, especially where differences in terrain, drainage patterns, and exposure provide a diversity of conditioning factors affecting soil type and availability of moisture. These have been defined and mapped in considerable detail within the National Park (Potter, 1974), but comparable work has not been accomplished for the region as a whole. A study by the Soil Conservation Service identified four major vegetative zones in the upper Chaco Basin. The work included only the areas of the watershed above Cly Canyon and excludes not only the western lower sections, but the entire Escavada drainage. The zones described were the Pinyon-Juniper, covering 11.3 percent of the area; the upland Big Sagebrush-Grassland, involving over 14.6 percent of the area; the lowland Blue Grama-Galleta Grassland, encompassing over 44.7 percent; and the canyon bottom and floodplain Greasewood-Four Winged Saltbush, covering 2.4 percent (Soil Conservation Service, 1973). Potter (1974), in contrast, was able to describe three types of grassland, three of shrub-grasslands, two woody, a vegetated dune type, and two successional types (one for old fields and one for areas of watershed treatment), in addition to two unvegetated types, bare rock, and active dunes. Beyond the park boundaries exists further diversity, often on the scale of micro-niches which are negligible in terms of area covered but which were undoubtedly of importance for human occupation of the country.

Precipitation averages about 8½ inches annually, but ranges to extremes from 3.35 to over 18 inches in individual years (US Weather Bureau). Most precipitation comes in the late summer. The uncertain late winter and spring precipitation is the critical factor for agriculture. If there is insufficient soil moisture at planting time, the Navajos do not sow crops except in the most favorable localities, although agriculture has decreased so in importance in recent years that present practices may not be representative of former customs. It is obvious that water is one of the more important factors controlling productivity of the land, however. Strong winds, particularly in spring, cause loss of moisture, but summer temperatures are usually not extreme. As of 1973, the average annual temperature was calculated at 47.8 degrees (National Climatic Center, 1973). Extremes were 106 degrees and -38 degrees. Variables in soil, from a complete absence in parts of the region to active sand dunes, bentonite deposits, and high salinity restrict the value of areas of varying extent for planting and grazing. Short growing seasons also place limits on plant growth.

Fauna, whether made up largely of domestic animals as today, or of game species as in the past, is under severe limitations as to numbers. The major big game species of earlier years were apparently mule deer and antelope. Introduced species include sheep, goats, cattle, and horses. Mammals of intermediate size include the usual range for northern New Mexico. Field observations during the survey included coyote, badger, porcupine, cottontail rabbits, jackrabbits and prairie dog. Small mammals recorded by the ecological studies encompass 13 species of squirrels, rats, and mice. Density of these species is quite low (Potter, 1974). The ecological studies were conducted within the Park where the animals are protected and probably subject to less pressure than they ever were during periods of aboriginal occupation. Birds and reptiles seen during the present project included a golden eagle, prairie falcons, sparrow hawks, ravens, quail, cliff swallows, hummingbirds, rattlesnakes, collared lizards, and several unidentified small birds and lizards. Spade-foot toads are common in the canyon, but no other amphibians were noted.

The faunal resources would appear to be sufficiently limited to be easily over exploited by human use and probably incapable of sustaining any direct competition from domestic species. Large game was seen only within the Park and on range where controlled number of cattle were grazed. The range is sufficiently fragile that excessive numbers of grazing animals can quickly damage its productivity.

Methods

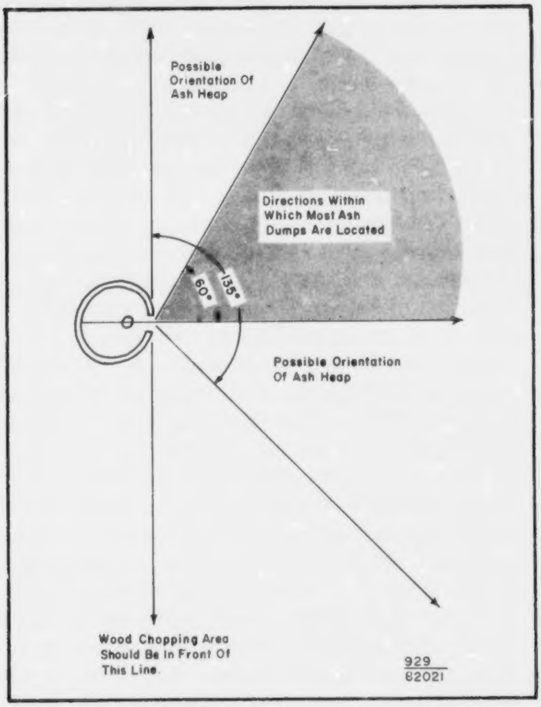
Since the aim of the survey was to obtain a representative sample of the kinds of sites dating within the historic period rather than a random sample of sites in proportion to their frequency, heavy reliance was placed on local guides to find sites. In addition, selected sites located during prior surveys by Vivian (1960) and the intensive survey by the Division of Cultural Research of the Park were visited, and some purely exploratory searching of limited areas was undertaken. Whenever possible, the sites were visited with local guides, and such traditional history or personal memories of the occupations as they were willing to impart were recorded. Some data of the same sort were recorded off the sites but always with the aid of an interpreter who had personally visited the site beforehand with the investigators to lessen any chance of confusion as to locations.

The writer personally visited and helped record all but six of the sites. Vernon Morgan, himself Navajo, cooperated in the taking of data during part of the 1974 season and recorded the remaining six sites. Orally transmitted information was interpreted in the field when the guides could not give it in English. No tapes were made of these interviews, which were typically rather short and conducted, as noted, on the sites themselves whenever possible. Separate studies under Oswald Werner of Northwestern University were made of Navajo place names and land use concepts in which interviews were taped for careful translation at a later date. These will be reported separately, but have been drawn on for some data in this report. Interviews of three whites who had spent time in the area in the past were taped.

All guides were Navajos who had lived all or most of their lives witin the region. No whites now resident in the study areas had been there more than a few years, nor did any of those encountered seem to consider that this was their permanent home.

The field form developed by the Navajo Tribe during the archeological surveys conducted for land claim research was used for recording the sites. It was well adapted for the older Navajo sites, but could be improved for some of the most recent sites and the Spanish-American and Anglo-American sites by the addition of categories of data not significant in the older remains. Use of this form entailed acceptance of certain unpublished findings of the land claims work which require explanation here. These relate to the normal association of any hogan or camp structure, such as a windbreak or tent, with external features. The features are the ash dump and thewoodchopping area. An ash dump should be found for all hogans or camp structures, unless obscured by erosion, and will usually be somewhat to the left of a line projected directly outward from the entry and generally within 60 degrees of this line. There is significant variation in this however, but in all cases of which I am aware, the ash dump was in front of the structure and within 135 degrees of a line projected at right angles at the entry to the left of a line out the entry (fig. 3). The reasons for these variations are not known and additional research in this matter is needed.

Woodchopping areas appear with some frequency at sites clearly dating post-Fort Sumner. Their presence may relate to the availability of both metal axes and wagons. If this is the case, sites with this feature probably date post-1880. Often, each hogan in these late sites will also have its own woodchopping area, but cooperative wood hauling may lead to some shared woodchopping areas, again a matter that requires further research. In most sites with this feature, the woodchopping area is in front of the structure, again usually to the left of a line directly out the entry, but with considerable variation, perhaps even greater than in the case of ash dumps. I would expect a single-structure chopping area to be in front of a line at right angles to a line projected out the entry, however. In all cases where a woodchoppng area was present in those sites which I have observed, it was closer to the structure than was the ash heap.


Possible Orientation Of Ash Heap
Directions Within Which Most Ash Dumps Are Located
60°
135°
Possible Orientation Of Ash Heap
Wood Chopping Area Should Be In Front Of This Line.
929
82021

Possible ash dump locations.

On the basis of these criteria, it is generally possible to relate specific structures to specific ash heaps and woodchopping areas, and to infer the former presence of structures of which no other surface traces remain. Two ash deposits may indicate a long period of abandonment between successive occupations or suggest some activity resulting in an ash deposit separate from that produced by normal housekeeping. Only oral history or excavation can reveal what the other activity might have been, but exterior cooking pits of various sorts probably account for most such features.

Sites were given letter (A, B, etc.) and letter plus number (A1, A2, etc.) designations in order to distinguish those included in this survey from those recorded only by the field crews engaged in the intensive surveys of the Chaco Project.

Collections on the older sites were of all minor surface artifacts that could be found. Many of these sites had been surveyed two or more times by previous workers. Where included in the surveys by Vivian or the Chaco Center, it was possible to locate the earlier collections, but those obtained by other workers could not be traced, and correlations of site identities were uncertain. At later sites, selective collecting was done. Artifacts too large for sacking, such as stoves, old cars, bedframes and the like, were merely noted and sometimes photographed. Smaller artifacts were sampled primarily on the basis of field judgments of their utility for dating. All sherds of Indian pottery, most crockery sherds including all with designs or trademarks and all glass bottoms, necks and trademarks were collected. Dating and identifications done later by Emily K. Abbink revealed that even small pieces of glass can provide temporal information, and in any further work, more intensive collecting of glass to obtain samples of all varieties should be done.

Historical research and the archological work proceeded concurrently. Most of the archival and library searches had been completed by the time the major field effort was well underway. While the materials resulting from the investigation of documentary sources had not yet been thoroughly analyzed, the general background knowledge already gained was quite useful in orienting the survey, while information gained in the field gave insight into some of the historical problems.

Only limited effort was made to identify in the field specific sites appearing in the documentary record. The first effort at this was unsuccessful and felt to be too time consuming to be justified. As the site data presented below demonstrate, it turned out to be more profitable to work from the known sites to the documents. A fairly high proportion of the more recent sites could be correlated with documentation contemporary with their occupations. In addition, several sites could be dated on the basis of tradition that they were occupied at the time of an event for which documentation existed. The best general time markers in local Navajo tradition are the Fort Sumner exile, 1863-68, and the killing of Richard Wetherill in 1910. But, other events were also useful in certain instances. Events that covered extended periods, such as stock reduction and the removal of the Navajos from the Park, sometimes turned out to be confusing when precise dating was attempted; but these and national prohibition do provide useful aids, as do the government work projects undertaken in the area during the depression.

It was not possible to do an ethnographic census of the region; and such data on present demography, settlement patterns, and population shifts as were noted are rather haphazard. It was hoped that a diachronic study of clan distributions could be done utilizing the traditional data on the sites and present residence patterns, but neither are really adequate for the purpose. The interrelationships of settlement, land use, legal land status, and social organization are clearly far more complex than originally anticipated. Further work on this problem, more intensively focused than was possible given the other requirements of these studies, would be very valuable.

Recording of rock art was done only by reconnaissance survey, and no traditional or ethnographic inquiries were made. Since this is a field of study where a great deal of romantic nonsense has been accepted quite uncritically by the general public, ethnographic or ethnohistoric study seems called for.

The Navajo Sites

The vast majority of sites recorded had Navajo occupation. Most of these were single component sites or sites at which only the Navajo use had resulted in significant archeological remains.

The data on the Navajo sites are presented in a temporal sequence, utilizing six time periods, one of which overlaps two of the others, and a final category for sites which cannot be dated with sufficient precision to be satisfactorily assigned to any of these periods. Constraints on the definition of these time intervals are inevitably a result of the suitability of the remains for dating by various means. The methods most relied upon were tree-ring dating, typological changes, historical documentation, and Navajo oral tradition. Keeping these constraints in mind, an effort was made to relate these time periods to events of general significance in Navajo history. Two early events that predate the remains identified as Navajo in this work—the arrival of the Navajos in the Southwest and the Spanish conquest of the Pueblo peoples—cannot be given consideration in this study. The Pueblo Revolt of 1680 initiated a series of developments that led almost inevitably to the beginnings of the archeological record described here. The initial success of the Revolt was shattered by the return of the Spaniards in the 1690's. Many Pueblo people fled Spanish vengeance to live with other tribes, a large but unknown number joining the Navajos on the upper San Juan River and its tributaries. About a generation later, the earliest known Navajo sites in the Chaco country provide the start of an archeological record that blends imperceptibly with the present.

The beginning date of this record is believed to be about 1720. The year 1800 has been chosen for the end of the first time period because of changes in ceramic types at about this time. It is also close to the beginning of an extended period of escalating warfare between Navajos and whites, however, and thus relevant in terms of Navajo history. The end of this second period coincides with the final Navajo war when Kit Carson dealt the tribe a military defeat in 1863 to 1864 that forced most of the Navajos to submit to captivity and an exile at Fort Sumner that lasted until 1868.

The third period begins with the Navajos' return to their own country in 1868 and extends through World War I or about 1920. The overlapping period, 1880 to World War II, begins with the expansion of trading posts in Navajo country as a result of the approach of rail transportation. It is treated as a distinct period here because of the difficulty encountered in dating several sites more precisely than within these limits.

The period from about World War I to World War II covers a time when the expansion of white ranchers into the eastern Navajo country reached proportions that created a chronic condition of crisis for the Navajos of the region.

It also encompasses the stock reduction efforts of the Bureau of Indian Affairs, efforts that were taken to limit the numbers of livestock owned by the Navajos to the capacity of their grazing resources.

The time since World War II, although poorly represented in the survey, leads to the present and represents the period of the most far-reaching changes yet to take place in Navajo lifeways.

These periods have not been formalized by applying phase names, nor have I made any attempt to try to fit them to previously described phases. I have preferred the somewhat greater flexibility for working between the archeological record and the historical record that this approach allows, avoiding in the process the problem of taxonomic dispute that would be inherent in use of the phase system. While these periods may be regarded as functionally equivalent to phases for purposes of analysis of the data reported upon herein, their utility for a similiar analysis of Navajo archeological data from future studies is explicity not implied by my usage. Our detailed knowledge of Navajo history provides us with so many events of importance that may be used for differing sets of data and different research designs that I believe that to do otherwise (expecting future workers to follow blindly a system of classification developing from this study of a relatively discrete geographical area and of a limited number of problems) would be presumptuous on my part and would probably lead only to quibbling over typological criteria in a manner that would be counterproductive.

I do not wish my approach to be taken as unduly critical of other workers who have made use of the phase system. It has been a fertile method for the early stages of investigation of Navajo archeology. As our knowledge increases, however, and the difficulties involved in establishing congruence between cultural changes as evidenced in archeological remains and events in Navajo history increase in complexity, I am confident that the less structured method applied here will be found preferable for most research in this field.

18th—Century Sites

A total of 20 sites was assignable to the 18th century. It was possible to make some distinctions between later and earlier sites in this group, but there was sufficient ambiquity in several cases that it seems preferable to describe the sites together, indicating the differences where applicable.

Dating was based on tree-rings, pottery types and architectural features. Since only five of these sites produced tree-ring dates and only two of these show good clusters, this method cannot be relied upon for very many of the sites, but it does provide important evidence for further refining the typological criteria utilized for dating the remaining sites. Most of these sites produced ceramic collections. Of these, 17 yielded Dinetah Utility, the common Navajo culinary pottery from about 1700 to 1800 and an almost certain indication of occupation during the 18th century. Puebloan trade wares of various types often help place the date within a somewhat narrower range, as does the the presence of Gobernador Polychrome. Strongly Puebloan architectural features, indicative of the presence of Pueblo refugees from Spanish rule or their immediate descendants, were considered early and seem generally to correlate with other evidence of occupation early in the century. Navajo pottery that approaches the modern types, particularly Dinetah Utility, Transitional Variety, and a mixture of 18th-century and 19th-century types are suggestive of a later occupation.

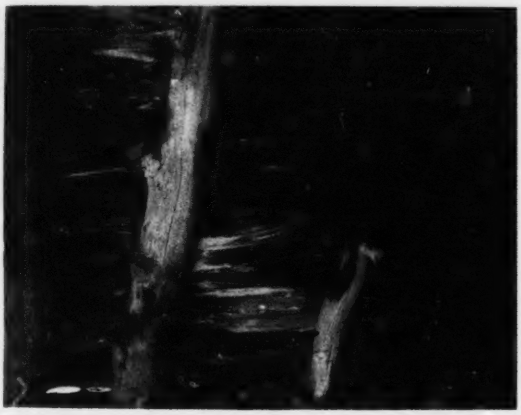
Interior doorway between Room 1 and 2, Pueblito 1, Site K5.

Pueblitos

The most strongly Puebloan features at any of the sites, pueblitos or small pueblo-like structures, were found at five sites. A structure was designated a pueblito if it was of stone, had two or more rooms, had clearly rectanguloid or elongated rooms and at least one room with no direct access to the exterior, but with access only by way of another room (fig. 4). Most were constructed of a distinctive masonry usually called "refugee" in the Chaco region. This masonry style results from a tendency to use unshaped and somewhat regular sandstone slabs which, when most of the original mud mortar has been weathered from the walls, presents a rather easily identified texture that differs from that of the masonry of either Anasazi origin or of later Navajo and white construction. Walls are relatively thin, averaging about 10 inches in width. A liberal use of adobe mortar would have been required to make these walls weathertight. Whether the stone itself formed a portion of the original exterior or was concealed under a full coat of plaster is not known, although wall interiors were plastered. In at least one instance, a whitewash had been used over the interior plaster.

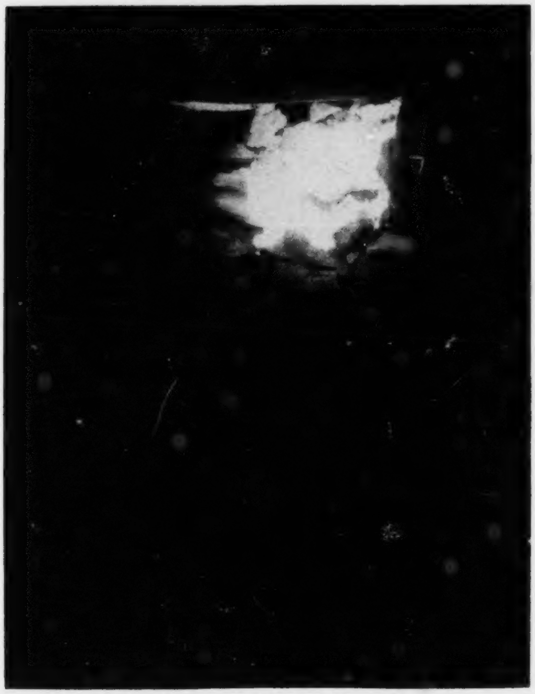
All of the pueblitos known for the Chaco region are relatively small. Of those visited in the course of the survey, three have two rooms, and two have three rooms. Rooms generally are rather small and tend to be either squarish (ranging from 7 feet by 7 feet to 10 feet by 10 feet) to markedly elongated (ranging from 6 feet by 10½ feet to 8 feet by 21 feet). The elongated rooms frequently have rounded corners or rounded ends, the longer walls being straight and parallel, or nearly so. Entry of the elongated rooms is in one of the long walls. The roof, where still present, is of vigas covered with split juniper latillas, small branches, and stone slabs. Pinyon was the favorite material for the vigas. Lintels for doorways and for the one window are of pinyon poles or of split juniper. The single window is about 1 foot 8 inches by 2 feet 8 inches wide in the south-facing wall of the front room of the pueblito at Site K5. This window, however, appears to be due to reuse of the structure since 1960 (Hannaford, 1978). Logs from the roof extended outward over the opening, shading it and doubtlessly helping to keep out rain (fig. 5).

Where sufficiently well preserved, the walls extended well above the roof, forming a low parapet which may have been used for defensive purposes (fig. 7). In addition, loopholes were noted in the walls of three of the pueblitos. Concern for defensibility is apparent in the locations chosen for three, these being on elevated ground with obvious tactical advantages should an enemy approach along the canyon bottoms at least, although often exposed should they have been attacked from the mesa tops. Only one, at Site E9, was in a fully defensible position on the top of a steep-sided crag. All four, however, commanded good views of the more likely approach routes. A hearth could be identified in only the front room at Site K5 (fig. 6). It was of the typical corner variety with a curved branch set with an end in each wall about 3 1/2 feet above the floor. An opening in the corner of the roof above and indications in the plaster suggested that there had originally been a smoke hood supported by the branch and funnelling into a small chimney. Additional interior features at this site included a ventilator hole measuring about 4 inches by 3 inches connecting Rooms 2 and 3, and a wall niche about 2 1/2 inches by 6 inches, and 8 inches deep in the northeast wall of Room 2. Two small wooden pegs in the walls of Room 2 at B1 were probably used to hang portable objects.


Ceiling of Room 1, Pueblito 1, Site K5.

Trash heaps were identifed for two of the pueblitos. These are true trash heaps as in the Puebloan tradition, disposal of all kinds of waste materials in some quantity being indicated by their contents. They are well removed from the buildings. At K5, the trash area is 55 feet to the northeast from the entry. The trash heap at K6 is also to the northeast of the entry at a distance of 40 feet.

Entry orientations are variable. Although not identified at A9, it is presumed to have been to either the north or west unless a roof entry was used, for the south and east walls are sufficiently well preserved to show that it was not in those directions. The doorway of the pueblito at B1 is oriented at about 116 degrees, that at K5 at 63 degrees, and that at K6 at 109 degrees. Thus, while an easterly orientation is common, it is by no means universal.



Remains of smoke hood and chimney, Room 1, Pueblito 1, Site K5.

Vivian (1960) obtained tree-ring dates from two pueblitos, those at E9 (Vivian's CM-18) and K5 (Vivian's CM-38). The former produced dates of 1634vv, 1726vl and 1745xv. (For explanation of suffixes used with tree-ring dates, see Appendix A.) Only the two later dates may be considered to place the death of the trees temporally and the lack of clustering makes interpretation of their significance somewhat uncertain, but they fall within the period of pueblito construction in the Largo-Gobernador region east of Farmington, New Mexico. Vivian's dates from K5 are 1600+v, 1659+vv, 1730+vv, 1738vLG, 1738vLG, 1739G, 1739vL and 1739vvL. Four additional dates for specimens cut from different logs than those sampled by Vivian were as follows:

Room 3, viga fragment	1633vv
Room 2, 3rd viga from west	1722v
Room 2, roof fragment	1738vG
Room 2, 2nd viga from west	1739+v

These correlate well with Vivian's (1960) dates and indicate a construction date of about AD 1739 for Room 2. This room was the first built as indicated by the wall abutments. Since both Room 1 (the front room) and Room 3 were built later than Room 2 and the latest dates are 1739, it is highly probable that the entire structure was erected in that year. The exact provenience of Vivian's specimens is not known. The earlier dates are so scattered that even though some might be considered "cutting dates," their relationship to the occupation of the site is uncertain.

Pottery associated with the pueblitos is clearly attributable to the 18th century. It includes:

Dinetah Utility (Brugge, 1963)
Dinetah Utility, Micaceous Variety (Ibid.)
Dinetah Utility, Transitional Variety (Ibid.)
Ashiwi Series, black rim (Harlow, 1973)
Puname Series, red rim (Ibid.)
Gobernador Polychrome (Brugge, 1963)
Navajo Painted (Ibid.)

The rarity of Dinetah Utility, Transitional Variety, which is restricted to the late 18th century and was represented by only one sherd in a pueblito context, indicates that pueblitos were built and occupied largely in the early part of the century in the Chaco region. This suggests that the Chaco sequence is more closely related to that in the Largo-Gobernador country than to the regions to the south and west where there was some later pueblito construction (Brugge, 1972).

The Ashiwi and Puname associations are less helpful and will be discussed in more detail below when the ceramics are considered in greater detail.

Houses

Nine structures were classified as houses. These are single-room rectanguloid masonry buildings presumed to have functioned as dwellings. Some structures with extremely small second chambers, probably for storage, have been included in this category as well. The problem of distinguishing houses from hogans in sites of this period without excavation requires recognition. Accurate definition is not always possible and some structures were doubtlessly misclassified as hogans. A comparison of the survey data with the excavation data for Site B1 will illustrate this problem, but the extent to which this holds true for the totality of sites is uncertain.

Houses are an outgrowth of the same Puebloan influences that led to pueblito forms and they fall into the same two categories as do pueblito rooms, that is, elongated and squarish. The squarish structures are those that most resemble hogans and that are most easily confused when in a ruined condition.

Parapet around roof of Room 1, Pueblito 1, Site K5. The hole in center foreground is for the chimney

Two of the sites with pueblitos, A9 and B1, are also the sites with the greatest number of houses, three in each case. Excavations at B1 later increased the count somewhat at that site, but for purposes of having comparable survey data from all sites, the survey classification will be used here. The remaining three houses were components of sites in which hogans and windbreaks were the predominant forms of shelter.

Few features could be observed. Floor sizes ranged from 9 feet by 9 feet to 21 feet by 9 feet. The greater dimension was usually the north-south one with the entry oriented easterly within the range of possible sunrise directions. However, one house was oriented well to the south of this range and another well to the north. In the latter case, there is traditional data to suggest religious reasons for the aberrant orientation. This structure, House 9 at B1, is said to have been used for rites connected with warfare and hunting. It is also the only house with a loophole. It is probable that this structure was never a dwelling. Another unique feature of this building was a short entry passage or vestibule.

In only one case was the hearth location identified. In House 3 at A9, there was heat-reddening of the wall in the northeast corner, indicating a corner fireplace of some sort. Whether this hearth was supplied with a smoke hood could not be determined.

Two of the structures had small rooms added. To House 7 at B1, a 5 feet by 5 feet chamber was appended on the south end. This would appear to have been of little use except as a storage bin or granary. A larger chamber, 10 feet by 8 feet, was built against the north end of the house at E6 and against the ledge that forms the back wall of both. There is sufficient low overhang above the floor to prevent use for human occupation, and, again, identification as a granary or some similar storage area is suggested.

An additional observation worth making is with regard to the lack of a clearly identifiable entry to House 7, Site B1. The entry may have been purposefully blocked. The presence of slabs larger than most masonry stones in the rubble of the east wall would appear to support this conclusion. Together with the very poor condition of the north wall, the suggestion that a death took place in the house and that subsequent abandonment followed a traditional Navajo pattern for such circumstances seems reasonable. Slabs appear to have been used to close entries in more normal circumstances as well, however.

Only one of the 18th-century sites with houses has produced tree-ring dates, and only one of these dates is from a house. This is Site E6. The north door post of House 3 yielded a date of 1747vv. Other dates from the site are 1748vv and 1778 for Hogan 1 and 1784vv for Windbreak 2. None can be considered cutting dates, but the tendency toward two clusters suggests two periods of building some three decades apart.

Relatively little pottery came from direct associations with houses and this was limited to two types, Dinetah Utility and Navajo Painted, the former including a significant proportion of the Transitional Variety. Continuation of the use of houses into the latter part of the century seems to be indicated, but the evidence is far from conclusive.

Hogans

Hogans assignable to the 18th century totaled 43 from 15 sites. Many of these were grouped in this period on the basis of their inclusion in sites that generally fall into the century rather than being dated individually. They form, nonetheless, a unit in which shared features seem to be as common as diverse features. Hogans are herein defined as all roundish or polygonal structures that may be presumed to have functioned as relatively permanent dwellings.

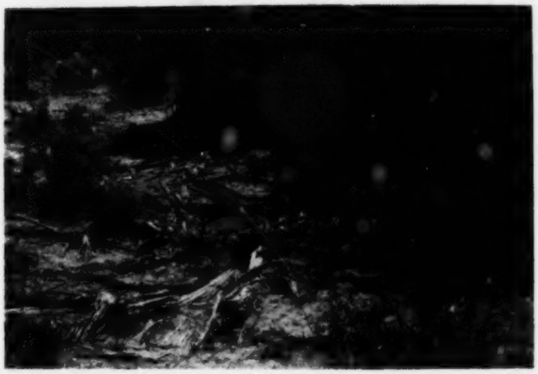
The majority of hogans of this period are of stone masonry, again frequently conforming to the "refugee" style. There are 26 stone hogans included. Another 11 hogans are of wood, all but one being of the classic forked-pole type (fig. 8). The one exception is of the cribbed-log type. In addition, there are six hogan rings with so little remaining of the walls that the kind of construction is not known. Most of the hogans of the period are rather small, average interior diameter being 10.7 feet, but with a range from 8 feet to 18 feet. Few are perfectly round, but most free-standing hogans approach this ideal, with no polygonal structures being identified in the survey data. Excavations later provided contradictory evidence and it must be kept in mind that observations based only on surface features at these early sites are often subject to uncertainties with regard to detail. A number of hogans were built against boulders and ledges, often taking advantage of overhangs and rock shelters either for added floor space or as storage areas, depending on the dimensions of the naturally sheltered spaces. These hogans are D-shaped. There are eight of these with masonry in the present sample, one apparently built of poles somewhat in the manner of those described for the Glen Canyon area by Adams (1959) and one with only a foundation remaining. A standing juniper tree was incorporated into the cribbed-log hogan.

Three double hogans were noted. These differ from pueblitos in two basic respects. First, each chamber has its own entry from the exterior, there being no doorway between the two. Second, the rooms conform in ground plan to the traditional hogan shape, lacking the rectanguloid tendency of pueblito rooms. The two rooms, probably each the dwelling of a single family, do share the same ash heap, however.

Vestibules are not commonly observed, having been noted for only three structures, two of stone and the one cribbed-log. In each case, the vestibule was of stone, had low walls and did not extend out more than about 3 feet from the entry. Entry orientations are generally within the variation in sunrise; but enough exceptions were recorded, both to the north and south of this pattern, to suggest that other factors were also sometimes taken into consideration, even assuming some margin of error in making observations on poorly preserved remains.

Ash heaps seem to conform to modern Navajo practice and to have been used for purposeful disposition only of ashes. Other waste was present in such small quantity that its inclusion may be considered accidental, as is also true of the house ash heaps noted above. They were, however, much closer to the hogans than is true of modern Navajo ash heaps. Combining both house and hogan ash heap distances, as measured from the entry where this is identifiable, the average distance is only 12.5 feet. In the dwellings believed to date during the early part of the century, there is far more variation, from 8 to 35 feet, with an average of 20.2 feet, while the later dwellings have a range from 5 to 15 feet and an average of 11.9 feet. It would appear that some of the earlier people were conforming somewhat more to Puebloan standards for ash disposal. The one extreme example, of 35 feet, is for Hogan 4 at Site E9 (which also has one ash heap at only 8 feet distance). It is possible that the more distant ash heap was the result of occupation of a structure not definable on the surface or that two occupations of the same hogan resulted in separate deposits. Ash heaps were generally northeasterly from the entry, usually somewhat to the left of the entry as seen when facing outward.

Abandonment of Hogan 4 at Site D10 was obviously due to a death that occurred within the structure. The entry is blocked by sandstone slabs, the north side is broken out, and a burial was found under a nearby boulder. Three other hogans, Hogan 7 at B1, Hogan 1 at D10, and Hogan 1 at E1, also had the north walls broken out and lacked identifiable entries, possibly the result of having been sealed at the time of abandonment. Hogan 1 at E5 had the entry blocked with upright sticks, but the north wall did not appear to have been disturbed, while Hogan 4 at E9 had a collapsed north wall, but an unmodified entry. A rockpile with numerous sherds at the site may be a grave. Hogan 2 at B3 was merely a hogan ring with a 5 feet by 8 feet rock pile within the floor area on the south side. That the hogan might have been dismantled and the rock piled over the body of a person who had died within would be consistent with traditional Navajo practice in some areas, but that this happened here is far from certain. In any case, a rather high proportion of the dwellings of this period do seem to have been deserted as a result of mortuary practices, and it is possible that two deaths took place at D10. That this high mortality rate in hogans might in part reflect a major epidemic, perhaps the smallpox of 1780-81, is worth consideration. Four of the six sites producing data suggestive of mortality so sudden or overwhelming as to prevent removal of the



Eighteenth century forked pole hogan, Hogan 1, Site D7.

patient from the hogan prior to death do seem to date from the latter half of the century. The other two are uncertain as to their placement within the period. The ch'indi house described above might date from the earlier part of the century, but has associated pottery indicating occupation past 1750.

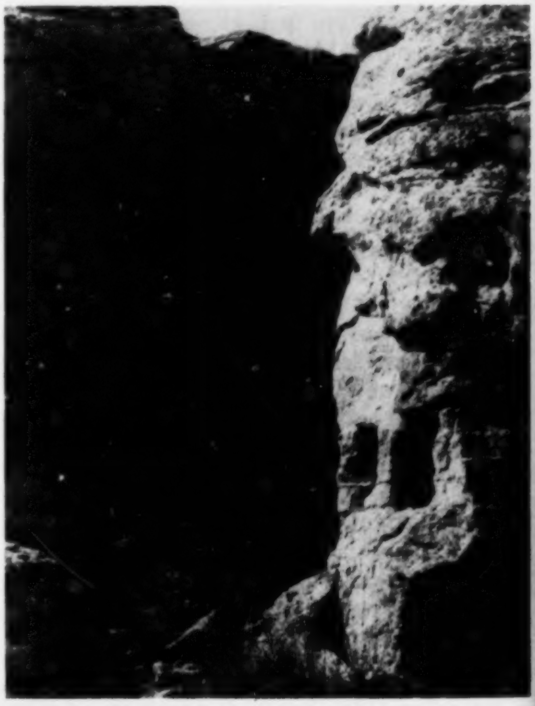
Tree-ring dates for hogans are available only for structures occupied during the latter portion of the century. They are as follows:

E5, Hogan 1,	north side pole	1720vv
	roof pole	1745vv
	south side pole	1756+vv
	north door post	1769++vv
E6, Hogan 1,	north side pole	1748vv
	south fork	1778+vv
E7, Hogan 1,	south fork	1772vv
	south side pole	1778+vv
Hogan 4,	east side pole	1766+vv
Hogan 5,	north side pole	1776vv

None of the dates provide evidence individually of being cutting dates and none of the timbers from which the samples were taken showed ax marks. Three of the specimens from E5 were felled by breaking, a method not likely to have been successful with a living tree. Therefore, all must be considered minimal dates for the antiquity of the structures. The good cluster from E7, however, is sufficiently close that it seems improbable that it preceded by much the time of occupation.

The hogan at E5 is the one cribbed-log dwelling (fig. 10). The other four are forked-pole hogans. Vivian (1960) presents dates from three more sites for forked-pole hogans. At CM4, the dates were 1773+vL and 1779+vv. At CM150, one date was obtained, 1704+vv. These are reasonably good dates in view of the ceramic associations at these sites, although only the 1773 date might be considered a "cutting date." The closeness of the two dates from CM4 is also suggestive of a fairly good temporal placement for the site. The other site, CM 35, produced seven dates ranging from 1350 to 1598, all vv dates that showed no tendency to cluster. Interpretation of such series of dates, which have been noted for several Navajo hogans, is a problem for which further data are required; but use of dead wood, whether from older hogans or from trees that had died of natural causes, is the most probable explanation. The fact that such sequences are not rare provides reason for the exercise of considerable caution in accepting a single date from a site unless the cultural data are entirely compatible with the date.

Associated ceramics at these hogans, from 23 of the total, include Dinetah Utility, Dinetah Utility Micaceous Variety, Dinetah Utility Transitional Variety, Navajo Utility, Navajo Painted, Ako Polychrome, Ogapogee Polychrome, Ashiwi Polychrome, and San Pablo Polychrome, as well as an unidentified micaceous type and untypable sherds of the Ashiwi and Puname series. Only red rims are present on the San Pablo sherds, and one Ashiwi sherd is from a vessel with a red base. These types are indicative of occupation throughout the 18th century, the few Navajo Utility sherds from one site showing that occupation there probably continued beyond the end of the century. Of the 23 hogans with direct ceramic associations, 12 are stone, eight forked-pole, one cribbed-log, and two mere hogan rings. There is no



Walled crevice of fortified site in Rafael's Rincon, Site E1 significant correlation of earlier or later pottery types with these structural types.

Wooden hogans were found only in areas where timber was nearby, while stone hogans were noted throughout the area, except at the higher elevations on Chacra Mesa where timber was most abundant. There is a strong suggestion of seasonal movement in the distribution of dwelling sites. Many sites are along the northeastern base of Chacra Mesa or within the lower portions of the canyons emerging from the mesa. They were close to potential fields, fields that frequently have been farmed by Navajos in modern times. These sites include stone hogans, small houses, and pueblitos. The sites at greater elevations are frequently on the slopes of the mesa, or sometimes on benches along the sides of the canyons, close to firewood, stands of pinyon trees, and potential areas for deer hunting. They are more sheltered from the wind and farther removed from easy routes of travel. The traditional pattern of seasonal movement for the present-day Navajos of the region is from winter homes on the mesa to summer homes in the valleys, a pattern that has now been greatly disrupted by land ownership which restricts access to parts of the range. A similar pattern appears to have been observed by the 18th-century Navajos, with defensive precautions as another essential consideration at that time. Sites near agricultural land tend to be somewhat larger than the winter sites and more

Detail of log felled by burning as it is used in hogan wall, Hogan 1, Site E5.

exposed to enemy attack. They are situated on defensible heights and frequently include such provisions for warding off attack as loopholes, parapets, lookouts, and structures where war ceremonials might be held. The sample obtained in the present survey is not adequate to conclusively demonstrate the seasonal nature of the distribution. In particular, it is deficient in good coverage of the higher portions of the region, but the interpretation given here would best fit that data now available.

Ramadas.

Only one ramada, a rather large structure measuring 30 feet by 15 feet and built of juniper, was found. This was at Site D7, a high elevation site consisting largely of forked-pole hogans. It produced no tree-ring dates. Associated ceramics were limited to Dinetah Utility and Dinetah Utility Transitional Variety. Use as the cook structure for a major ceremonial, possibly a Nightway if used during the winter, seems most likely. The presence of one rather large hogan in this complex lends additional support to the suggestion that a ceremony of this sort was held here.

Windbreaks.

At Site E6, there are two structures which were probably no more than windbreaks. One, built of wood, was so poorly preserved that no detailed description is possible. Three long poles are in the remaining debris, so that a hogan cannot be ruled out, however. The other is a semicircular rock wall sheltering an area about 8 feet by 5 feet under a juniper tree. Although this seems to open to the northwest, an ash dump was found about 14 feet to the northeast. The former produced a tree-ring date of 1784vv and sherds of Kiapkwa Polychrome with a black rim were found in the ash dump of the latter. A late 18th-century date seems most reasonable for both.

Lean-to.

A structure at E9 built of pinyon and juniper cut with an ax was probably a lean-to. It opens toward the northeast and has a stone wall closing the southeast end. The floor area measures about 10 feet by 12 feet. No ash dump was identified.

Corrals and Lamb Pens.

Structures for livestock are relatively rare at sites of this period. At A9, a large rambling stone corral covers one end of the mound of Una Vida ruins. Its contemporaneity with early Navajo structures is not certain, although it seems to be in about the same state of disrepair. Reports of Spanish-American sheepherders corraling their stock in the major Anasazi ruins date from well into the 20th century. A D-shaped structure measuring 12 feet by 8 feet within the corral and built against the wall may have functioned as a lamb pen, although it seems rather large for this purpose. At B6, an area semienclosed by rocks may have served as a sheep bedding area or indicate the former presence of a full corral. Again, a D-shaped stone enclosure, 10 feet by 10 feet, seems to have been used as a lamb pen. This site also had reuse in the present century, and the apparent contemporaneity of the stock enclosures with the hogans may be misleading.

Fortifications.

The most elaborately fortified site is located on a crag in Rafael's Rincon. Access to the top of the crag is possible only from the north side. A large crevice, which would have provided a relatively easy route of ascent, was walled up completely (fig. 9). Rims on the north side were lined with low rough walls and piles of rocks ready to be hurled at enemies below. On one small promontory is a small, oval, stone-walled lookout or "watch pit." Hogans below these defenses would be exposed to looting by an enemy, but the residents could secure safety for themselves and portable property on the crag. A Navajo tradition survives of a Ute raid on *Hastiin Gaa'bizhi* and his family at this site. The Navajos took refuge on the crag and watched the Utes destroy their fields. The date of this raid is not known.

Site B4 consisted of a simple, elongate masonry structure on the tip of a rocky rim. The structure has interior dimensions of 14 feet by 8 feet and may have had a south-facing entry. The complete lack of occupational debris and difficult location suggest that this was also a defensive retreat. Masonry of the "refugee" style indicates a relatively early date.

Site E7 is on a point overlooking the lower portion of Tachii Canyon. A bench below the mesa top is accessible from below, and a rough low wall built of rocks and of pinyon and juniper felled by breaking and burning helps block ascent by this route. The defensive works doubtlessly date from the same time as do the hogans, the late 18th century.

Two additional defensive retreats exist near Site B1 and will be described below in the section on "Other Navajo Sites." At least one of these, G8, has masonry sufficiently like the "refugee" style to suggest construction during the 18th-century, but neither can be dated with confidence.

Rock Shelters.

Five rock shelters with evidence of occupation or for storage were noted. That at Site B1 was probably a storage chamber, measuring about 10 feet by 4 feet with a roof height of only 2 feet and remains of a rough stone wall across the front. The interior of a shelter at E9 measures 10 feet by 15 feet by 5 feet and opens to the southeast. It is extensively fire-reddened, suggesting that a structure built here or that materials stored within the shelter had burned.

At K4, the only feature is a sheltered area 10 feet by 10 feet by 3 feet in an east-facing cliff. No structural indications were noted. At L2, there were two shelters, one 8 feet by 9 feet, and the other, 8 feet by 18 feet, both with high ceilings and thus suitable for camp sites. While a few rocks across the fronts of both indicate use, trash from later periods precludes determination of the date of the construction activity.

No tree-ring dates were obtained from the rock shelters, but Dinetah Utility was collected at all four sites, and in direct association with the rock shelters at E9, K4 and Rock Shelter 1 at L1.

Trails.

Paths or trails leading to many of the sites on elevations follow natural routes and show no surviving evidence of improvements. One trail at K6 was listed as a site feature because of the association of pottery with it, but the sherd postdates the site occupation.

Graves.

Four graves or probable graves were noted. Three of these are described above along with ch'indi dwellings with which they are associated. The other, at K9, is merely a pile of rocks about 6 feet in diameter and 4 feet high, its identification as a burial site being quite uncertain. No sherds were collected from graves, but the associations with 18th-century occupations seem quite well established.

Cairns.

One rock pile that can best be described merely as a cairn was observed at the cliff edge at K9. It measures 10 feet in diameter and 1 foot high. If contemporary with the rest of the site, it may have been a stock pile of rocks to throw at enemies approaching from below.

Sherd areas.

Sherd areas were found at three sites. At E9, the sherds were associated with ash, charcoal, bone and other debris suggesting an ash heap for a structure that could no longer be defined. At D7 and K9, only sherds were present, and in each case, they might have been from a single vessel. Either breakage at the site or disposal of a broken vessel seems indicated.

Sweathouses.

Traces of a sweathouse were found at E9. These consist of a large discard pile of heat-reddened rocks with a hearth about 13 feet to the west. This would indicate a westerly orientation for the structure and suggests some sort of ceremonial usage. The discard pile is quite large, measuring 10 feet in diameter and one foot high, evidently the result of long usage. A trench has been excavated into the pile from the east, possibly the work of pot hunters hoping to find a burial.

Potholes.

A few heat-reddened rocks near some shallow potholes at D1 may indicate the melting of snow for water by the occupants, a custom which Navajos report for the recent past.

Rock Art.

The dating of rock art is very tenuous for rock surfaces well suited to this use remain attractive over long periods. Sheepherders and casual travelers often add to panels produced at earlier dates. Two sites with early Navajo rock art that might be contemporary with their 18th-century occupations should be mentioned here, however. At K9, are five simply incised horses, one with a rider. These are rectanguloid and resemble other early Navajo horse panels associated with bows, deer hunting, and early bridle types. In addition, a geometric Ye'i figure also appears to be an early style. A more interesting panel appears at B6 (fig. 11). Located on the ledge that forms the rear wall of Hogan 3, it includes five horses. Three of these are done with a combination of incising and painting, in red and yellow, and have riders wearing hats. Two of the riders carry swords aloft. The style is highly geometric, the horses being somewhat rectanguloid, the riders' bodies tapering and their heads round. Although much more crudely drafted than the well-known pictograph of Spanish campaigners in Canyon del Muerto, the style is suggestive of that panel, and an early date contemporary with the occupation of the site seems likely. A more curvilinear pictograph of a horse above these and a lightly incised horse head to the left appear later and were probably done by sheepherders or even the workers who built the Park Service fence or the wagon road, both of which pass nearby. A storage cist and a surface hearth show that the site has been used within this century, perhaps by both Navajos and non-Navajos.

Petrograph of horsemen armed with swords, Site B6.

Unidentified Features.

At A9, a small stone structure, oval and measuring 6 feet by 2½ feet, cannot readily be assigned a use. It might have been a lamb pen but does not quite look right for this. At K6, a low stone structure, 2 feet square, also lacks any apparent function. Both may be the result of play by children or have been intended for some purpose which is not immediately evident.

Collections.

Materials recovered from these sites included Navajo pottery from 17 sites, Pueblo and other trade pottery from 14 sites, and stone artifacts from 13 sites. A number of the sites producing stone tools also had obvious evidence of prior Anasazi or prehistoric Puebloan occupation, and the origin of surface materials not datable typologically is not established.

Artifacts included scrapers, flakes and chips (probably largely debitage, but some showing use), projectile points, a planer, choppers, hammerstones, knives, a spoke shave, a drill, a notched flake, a possible gun flint, manos, metate fragments, a basalt ball, pot lids, and an ax. Materials utilized were generally local, the most common material for chipped stone being a fine-grained white petrified wood. Less common materials of local origin included gray petrified wood, white and gray cherts, white and gray chalcedony and quartzite. The most popular imported material was obsidian, most of which came from Red Hill west of Quemado, New Mexico, with lesser amounts from the Jemez Mountains and Grants. Vesicular basalt was probably from the Mount Taylor area. Chalcedony and opal from Washington Pass and a meta-basaltic greenstone, probably from the San Juan River area, complete the list of exotic stones.

The most common artifacts in the collections from three sites are projectile points, most of which are small triangular points with side notches and sometimes basal notches. At least 10 of the 28 points are of this general type. A shell bead and a fragment of a shell bracelet were reported by Vivian.

Bone from the sites includes antelope, mule deer, and probably sheep or goat. Bone was found at both the mesa top and lowland sites. A scrap of hide was also recovered from one site. Corn cobs, on the other hand, have been collected only at the sites at lower elevations. Miscellaneous perishables, all collected on surveys prior to the present one, have included a wooden handle, a bundle of peeled twigs, a weaving batten, basketry and notched log ladders (Vivian, 1960; Brugge, 1981).

1800 to 1868

Only 10 sites are assigned a date between 1800 and the return of the Navajos from Fort Sumner in 1868. Some of these were dated on rather tenuous evidence. The number in the sample is so small that a finer breakdown would be of little value for descriptive purposes.

Hogans.

Permanent dwellings were limited to hogans, neither pueblitos nor houses appearing in the period. Stone hogans remained the most popular type, but both forked-pole and cribbed-log hogans continued in use. Of the 11 hogans recorded at six sites, seven were of masonry, two forked-pole and one cribbed. The remaining hogan was evidenced only by a ring. Average floor diameters were 11.1 feet with a range from 9 feet to 15 feet. No ash dumps could be identified. Entry orientations are generally easterly, but ranged from almost north to somewhat west of south.

Stone hogans were built of unshaped sandstone, a higher proportion of blocks being used than in the previous century, resulting in a chunkier style differing from the "refugee" masonry. D-shaped hogans built against a rock ledge or cliff, frequently taking advantage of overhangs, outnumber round free-standing hogans by five to two.

None of the stone hogans had indisputable evidence of vestibules. But stones and some collapsed small poles at the entry to one forked-pole hogan, Hogan 1 at D9, probably were part of an extended entryway.

The cribbed-log structure, Hogan 1 at E4, had a pinyon tree, now dead, incorporated in the rear wall and the tips of the base logs oriented to the rear center. Despite very rough wall construction, making use of untrimmed logs for the sides with numerous sandstone slabs to chink gaps (fig. 12), the structure appears to have had a roof and to have been more substantial than a mere windbreak.

Tree-ring dates were obtained only from Hogan 1 at D9 (fig. 13):

South side pole	1786vv
North door post	1791+vv
South side pole	1809+vv
West chink log	1852++G

Methods of felling are uncertain for two of these, but the earliest and latest were ax-cut. Only the latest date might be considered a "cutting date." It correlates well with the tradition regarding the site. The guide's grandmother was said to have lived in the hogan as a girl before going to Fort Sumner. She had her first menstruation at Fort Sumner, her Kinaalda and her marriage both taking place there. Her family was among the first to go to Fort Sumner, spending 5 years on the Pecos River. The hogan was thus left about 1863, possibly having some reuse after the family returned. A construction date close to 1852 is not at all unreasonable.

Detail of rock slab used as chinking in log wall, Hogan 1, Site E4.

Pottery was relatively rare at these sites. One small sherd, probably of the Puname series, was found at Hogan 1, E2, and some Navajo sherds were noted but not collected at Hogan 1, G7.

Navajo tradition provided the basis for establishing a date prior to 1869 for four of the sites with hogans. It should be noted that some other sites with very similar traditional associations proved, on the basis of tree-rings and ceramic materials, to predate 1800; and sites E2, E3 and E4 are very possibly assigned too late a placement. If so, the intensity of occupation during the early to mid-19th century may have been even less than suggested.

Windbreaks.

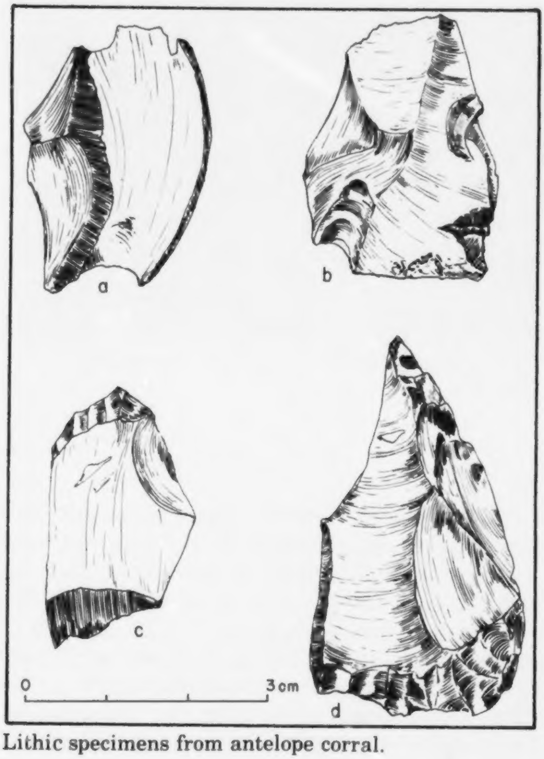
Temporary dwellings were equally sparse for this period. One structure which may have been either a hogan or a windbreak was noted at E4. Most of the materials had been removed by wood haulers, and all that can be said for certain with regard to it is that it had been built, in part at least, with pinyon felled by burning.

Corrals and Lamb Pens.

Only one structure for housing domestic animals was identified, a lamb pen at E2. It is a trianguloid pen built of unshaped sandstone and measuring about 8 feet by 5 feet.

Antelope Corrals.

That the antelope corrals of the region were built or used during this period is also uncertain, but it seems likely that, if the human population were as sparse as evidence indicates, game would have been particularly abundant. One corral, Site D1, was definitely identified and partially traced on the ground. All large pieces of wood had been removed by wood haulers. Only a line of small weathered fragments of juniper remained to show the former fence location, making mapping a very slow procedure. The right wing was followed for about 2,900 feet without reaching the end. The left wing was not followed, only the initial



Lithic specimens from antelope corral.

Nineteenth century forked pole hogan, Hogan 1, Site D9.

Stump of tree felled by burning near Game Corral 1, Site D1.

bearing being determined. The catch pen area had been used as a camp, perhaps by Spanish-American sheepherders, and wood gathering there appears to have been thorough enough that only two portions of the fence, together about 200 feet long, could be identified with certainty. Modern camp debris consisted of tin cans, a tent peg and stumps cut with a large metal ax during the recent past. A very low ridge separated the catch pen from the chute, resulting in the pen being somewhat hidden from view in a small valley, a rather common pattern for Navajo antelope corrals. The only portable artifacts found were two flakes of local white petrified wood, one merely a waste flake, the other showing evidence of use as a knife or scraper (fig. 14a and b). Both were discovered not far south of the proximal end of the left wing within the chute area. Several old stumps of junipers felled by burning were found in the corral area (fig. 15).

Sweathouse 2, Site E3. Note discard pile to right.

The second corral area visited, Site D2, had evidence of several old fence lines, again marked only by a few very weathered small pieces of wood, but none could be consistently followed for any distance. A small valley that would have served well for a catch pen was present, however. Two lithic tools, a white and brown flake of petrified wood with use marks along one edge and a tannish-brown chalcedony scraper-graver, probably reworked from a larger broken blade or scraper, were recovered (fig. 14 b-d). Both are of local materials. The evidence on the ground was quite inconclusive in the second case. The guide merely claimed to have seen an old fence line and was not sure that it had been part of a corral.

Two other reported antelope corrals were beyond the survey area and were not investigated. Traditional data, aside from providing locations, was not obtained as to the specific people who had built and used the traps other than the general knowledge that they were Navajos and a rather uncertain association of this use with the occupants of Site B1. If this association is correct, the corrals may have been built during the 18th century, a suggestion that would not be contradicated by the extremely weathered condition of the fragments remaining at D1.

Sherd Areas.

A site well up on the slope of Chacra Mesa, E8, consisted of two sherd areas with some other associated material, including ash, fragments of heat-reddened sandstone, unburned bone, and chips of petrified wood and obsidian. They appeared to be ash heaps, but neither hogans nor camp structures could be identified. All of the sherds were Navajo Utility except for one sherd of an Anasazi corrugated gray ware. The bones were of rabbit and jackrabbit.

Bone Area.

Within the same site was a feature that has been labeled a "bone area" for want of a better term. Over an area measuring about 10 feet by 20 feet were numerous fragments of charred bone, ash, and charcoal. One piece of bone collected was identified as a bovine, either cattle or bison being possible. The most probable of the two would be the domestic species.

Rock Art.

At G7, a boulder near the hogan had considerable rock art. The Navajo figures extended from present ground level or below to about 11 feet above the present surface and included a geometric Ye'i figure, a mask and a panel depicting a deer hunt on horseback, the horses and riders being in Style 3 (Brugge, 1976). That the Navajo rock art is contemporary with the hogan is not entirely certain, but inclusion of a bow and the old style Navajo bit in the drawings would not conflict with this interpretation.

Sweathouses.

Two sweathouses were recorded at E3. Both had been built of juniper, although only fragments remained at one. The better preserved structure (fig. 16) is about 8 feet in diameter and oriented to the south. The hearth is about 5 feet from the entry, and the discard pile is on the east side. Stone slabs are around the base. The other is so poorly preserved that observations were limited to the hearth location, again to the south, and the discard pile, again on the east side. The reason for the southerly orientations is not known.

Battle Site.

This site, C7, is a traditional location, lacking archeological remains at present. A small, double-peaked hill south of the Park is said to be the place where Navajo warriors overtook two Jemez horse thieves, killing them, and recovering their horses. The Navajos were from the mountains to the west, and the event probably took place during this period when the local population was at a low ebb. Subsequently, bits of bone from the site were used as enemy symbols in Enemyway for many years, until none were left.

Collections.

Navajo pottery was obtained at only two of these sites, and Pueblo trade pottery from only one. Lithic artifacts, other than cores, flakes and chips, were found only at the two antelope corral sites and E2, a hogan site with a long occupation. Here, a slab metate of basalt, a two-hand sandstone mano, and a small long-triangular projectile point with side and basal notches were found. The presence of Anasazi sherds on the site leaves some doubt as to the cultural origin of the stone tools. The site also produced a Rayo kerosene lamp, strong evidence that the site saw reoccupation after the return from Ft. Sumner.

1868-World War I

The exile of the Navajos at Fort Sumner on the Pecos River following their defeat by United States forces was a traumatic experience that had an impact on Navajo culture unequaled by any event since the arrival of the Pueblo refugees around the end of the 17th century. With the Navajos' return to their homeland and the establishment of peace, not only with the whites but with surrounding tribes, the people were able safely to occupy more intensively those areas that had for many decades been home to only a few scattered families and exploited primarily for their natural products by hunting and gathering. The population of the Chaco region grew rapidly, a fact well evidenced by the numerous sites, despite the competition for resources that soon developed with white settlers. The data available from the period from 1868 through World War II permit the temporal assignment of sites to three overlapping periods. The earliest of these extends from the date of the final Navajo Treaty in 1868 to the end of World War I in 1918, or in round figures, to about 1920.

There are 15 Navajo sites in this category. Except for the fact that sites occupied after 1880 (a result of the arrival of the railroad west of Albuquerque and the subsequent proliferation of trading posts) usually have far more trash resulting from trade with Euro-Americans, a finer distinction in terms of periods is difficult to make without tree-ring dates or documentation.

Houses.

Houses once again appear in Navajo sites and are quite obviously the result of Euro-American influences. Some, in fact, were constructed by whites. That at Site P is said to have been built by Spanish-Americans hired by Navajo George, a wealthy stockman. One or both of the stone houses at D5, included in a later period because occupation there continued well beyond World War I, may have been built by Anglo-American cattlemen as early as the 1870's and later taken over by Navajos (Judd, 1954). A similar tradition exists for a Spanish-American trading post at C6 where Navajo occupation again extends into a later period.

There are seven houses recorded from an equal number of sites that seem to lack any occupation later than about World War I times.

All are built of sandstone blocks and slabs. Most are of unshaped rock, but at A2, some of the blocks appear to have been trimmed somewhat. The house at this site is the only structure predating the end of World War I to exhibit this feature. Most masonry of this period was still composed of rocks merely selected for size and shape. One house, that at A7, has walls two rocks thick. This feature also is restricted to only one structure from this period.

The houses are all small. Four have only one room and range in interior dimensions from 9 feet by 15 feet to 10 feet by 23 feet. The two 3-room houses have the rooms in a row. At Site P, the rooms are 12 feet wide, and in length, measure 24 feet, 15 feet and 21 feet. At A2, they are 10 feet wide and lengths are 13 feet, 5 feet, and 12 feet. At D3, the house had two rooms. Widths were 13 feet and lengths were 20 feet and 28 feet.

All houses except possibly House 4 at Site L2 had squared corners. Entries, where identifiable, were in the longer walls and varied in orientation from 53 degrees to 156 degrees east of north. At Site P, there were entires from the exterior into the west room and the central room, but the east room could be reached only from the central room. At D3, both rooms had exterior doorways and also a connecting doorway between them.

True ash heaps, not trash heaps, were associated with the houses, at least at the two where these could be identified. At A2, the ash heap was 105 feet from the northeast corner of the structure at 27 degrees. At D3, it was 65 feet from the entry to Room 1 at 53 degrees. Coal ash was noted in the deposit at A2. At D3, there was an unusually large amount of bone in the ash heap.

At Site P, according to the guide, there were hearths on floors, much as in hogans of the period. One room at D3 had a corner fireplace with chimney in the Spanish colonial style. It was to the right of the entry as seen facing inward, thus being in the same relative position as corner hearths in the pueblitos of more than a century before. There are no data on the hearth arrangements in the other houses, but the use of coal at A2 would have necessitated something more elaborate than an open hearth.

Windows appear in at least some of the houses. At Site P, the guide described Room 1 as having had windows in the south and east walls, but no structural trace of them now remains. Window glass was collected at the site, however. Room 1 at D3 also had a window, the wall still standing high enough to preserve a portion of the aperture. Presence or absence of windows in the other houses is unknown.

Roofs, at least at P and D3, were flat and supported by pine vigas. Beams at two later sites, N and T, were said to have been used originally at P. All were ponderosa pine and produced a relatively long series of dates: 1829+vv, 1838+vv, 1863vv, 1868vv, 1875+vv, 1883+vv, 1884+vv, 1906+v, and 1921v. Only the two latest dates might be classed as close to "cutting dates," but are sufficiently late to suggest repair beams or even, in the case of the last, a beam cut for the site on which it was found. The two dates that are close in time, 1883 and 1884, probably do not predate construction by much.

According to tradition, the vigas were cut in Gallo Canyon prior to 1896, but the exact age of the house is not known. Site P was occupied at least until about 1910 and possibly until the Navajos were fenced out of this area. Navajo George and his wife lived here. Mrs. George probably died in 1904 during a severe diptheria epidemic (McNitt, 1957), but a grandson of this couple remembers living in the house until shortly before Richard Wetherill was shot in 1910. George was already an old man, but the date of his death has not been established.

A2 is said to have been occupied by *Ahyahi Ts'ósí* from prior to 1905 until his death about 1915-19. He died and is buried at the site, but no good surface evidence of the event was noted. A7 was the home of *'Asdáán Nanaasht'ézhí* who was born at Fort Sumner. The dates of her occupation here are not established by the Navajo traditional data available. The house at A21 belonged to Welo or Wero, but his residency here is also not datable. D3 was a residence for *Bit'ahnii Ts'ósí*, a prominent stockman who died about 1914-15. It is located on the northwest quarter of Section 10, T22N, R9W. This quarter section was allotted to *Bit'ahnii Ts'ósí* in 1908, his name being spelled Be-Tah-notsosa and his age given as about 31. (Tract Book, BIA Title Plat). No traditional date was obtained regarding D4 and L2.

Trade items associated with the houses generally support dating in the period assigned here. At P, the only collected datable material consisted of tobacco cans which are post-1900. Other trash on the site included tin cans, bottle and window glass, sherds of crockery, and some tar paper. An aluminum beer can was obviously recent. Historic trade materials associated with House 1 at A2 include dated materials for the period between 1860 and 1910. Undated materials left on the site include tin cans and other metal. There are no collections from House 1 at A7, where only tin cans were noted in association. At House 1, Site A21, tin cans and glass were noted, but none collected. House 2, D4, produced glass with a possible time range of 1873-1920. Both of these sites also yielded crockery which might date much earlier, but probably does not. Native pottery from these structures is limited to Navajo Utility from House 1 at D3 and House 4 at L2, the latter also producing a few sherds of an unnamed polychrome that was probably traded from the Rio Grande Keres pueblos.

Hogans.

Hogans remained by far the most popular dwellings, 20 being recorded from 10 sites. Of these, 13 are of masonry of unshaped sandstone blocks and slabs; two were probably of the same construction but are too poorly preserved for certain identification. One is a forked-pole structure, two are cribbed-log (fig. 17) and two others were of wood, but the type of construction is uncertain from the data available. Six of the stone hogans had been built against ledges or cliffs and had D-shaped floor plans. All others had round or nearly round floor plans, generally being slightly oval rather than exact circles. Floor diameters average 13.2 feet, the range being 8 feet to 17 feet.

Most of the stone hogans were built of the ordinary soft, light-colored sandstone most common in the region. The two hogans at A7 were of a dark brown sandstone, however. Pinyon and juniper were the materials for wooden hogans and for roofs and door posts for the stone hogans as well. Insofar as evidence remained visible, sawed lumber was noted on only one site, A5 at Hogan 1. Hogan 2 at K2, a cribbed-log hogan, had sandstone slabs used to chink spaces between the logs.

The only identified vestibule forms the entry of the only forked-pole hogan, Hogan 1 at K2. Entry orientations range from 76 degrees to 169 degrees averaging 109.7 degrees. Ash heap distances average 30.7 feet from the entries, the range being from 5 feet to 68 feet. The very close ash dumps, at sites K2 and K5, may date from an earlier occupation or from very early in this period. In any case, the placing of ash dumps more distant from dwellings became well established during this period, the average distance for all dwellings, houses and hogans, being 43.5 feet. It is the Navajo custom to clean the hearth and take the ashes out at the beginning of the day, suggesting that a greater sense of security following the end of the wars might have been a factor in taking it farther from their homes. Another factor, probably more important, may have been the availability of commercially produced artifacts such as shovels, dust pans, and buckets for use in this chore. Earlier, it is said that a piece of bark was the usual receptacle for carrying ashes. The traditional direction remained the same, generally somewhat to the left of a line directly out the entry. Contents of the dumps are usually ash, charcoal, bits of burned rock and occasional minor trash such as small sherds, unburned bone, chips and flakes of chert or petrified wood and small pieces of glass or metal. No coal ash was noted in any of the hogan ash heaps of this period.

Collapsed cribbed-log hogan.

Two of the hogans in this group appear to be ch'indi, Hogan 4 at A7 on the basis of the guide's knowledge, and Hogan 5 at K7 where the north wall is broken out. Together with the house noted above, three dwellings out of a total of 27 were probably places where a death took place. Since a portion of the sites occupied during the smallpox of 1897, the diptheria of about 1904, and the flu epidemic of 1918 are included in this temporal category, an even higher proportion might be expected. It may be that the stories indicating high mortality rates during these epidemics have been somewhat exaggerated, particularly with regard to the two in this century. There is an overlap in dating with the next period and possibly also with the period from World War I through World War II in regard to the flu.

Data based on tradition and personal knowledge of guides and other Navajos of the community is generally consistent with the dates assigned to these hogans. A2 has been noted above as dating from pre-1905 to about 1915-19. A5 was occupied prior to 1905 and probably abandoned well before the death of either of the couples who lived there, the husband dying about 1928. A14 is said to have been occupied by *Asdzáání Nééz* of the *Nanaasht'ézhí* Clan about 1918, but the length of her occupancy was not established. A15, another site attributed to Navajo George, was probably abandoned before 1910, since inscriptions by Spanish-American sheepherders begin with this date on the site, and it is unlikely that they would be using an occupied Navajo homesite for camping. A22 is reported to have been used as a winter camp about 1902-03 by *Hastiin Tsoh Bitsilí*. K2 was occupied by two brothers of the *Kįįyaa'áanii* Clan, *Bilį́į́'Łizhini* and *Daasa*, shortly after the return from Fort Sumner in 1869, but may have been first settled at an earlier date. K7 was used by Tomás Padilla until about 1918 as a winter camp. It was a place of refuge for families fearing further violence following the killing of Richard Wetherill in 1910. The suitability of the site for refuge (it lies on a bench on the south rim of West Mesa) and some of the remains suggest that it also may have had occupation during the late Navajo wars.

There are no tree-ring dates reported for any of the hogans in this period. Trash deposits supply some indications for dating. Hogan 2 at A2 had considerable trade material, including tin cans, enameled metal, glass, and wire. Only tin cans, glass, and wire were noted at Hogan 2, A5, but Hogan 1 also had planks and round nails associated with it. None of the trade goods at these structures was collected. A collection from Hogan 3, A7, produced outside dates from 1880 to 1930 with a clustering around 1900. The collection from Hogan 1, A14, yielded a much wider possible date range, from 1860 to 1952, but the late material is probably the result of frequent use as a sheep camp by Spanish-American herders. Dated inscriptions range from 1931 to 1955. At Hogan 1, A15, only tin cans were noted and none collected. Whether they are of Navajo origin or left by white sheepmen is uncertain. Hogan 2, A21, had tin cans and glass. Only wire, not collected, was recorded in association with Hogan 5 at K7. General collections from the site, not specifically associated with any particular structures, provide a date range from 1890 to 1927.

Indian pottery was found in association with 11 of the hogans. At two of these, there was some Dinetah Utility, suggestive of a very early occupation; but Navajo Utility was far more common, appearing at nine hogans and three sites. In addition, two hogans at two other sites produced only Pueblo trade wares, in one case a Tewa Utility type, probably from Nambe, and in the other, Zia Polychrome. The pottery would be congruent with the dating. It also indicates that, even allowing for earlier occupations at some of these sites, Indian pottery continued to supply some of the needs of the Navajos in this later period.

Tents.

One tent site was noted on the basis of a guide's statement, but the only physical remains that could be identified were those of a stone corral. This site, A17, may date no earlier than about 1919 when a nearby dam for stock water was built to facilitate summer grazing on the surrounding range.

Corrals and Lamb Pens.

Seven corrals were recorded at these sites. Four are of stone with advantage taken of structural features such as cliffs and rincons to partially enclose the areas (fig. 18). The other three are today no more than areas where a deposit of manure or vegetation, such as *Lycium sp.*, that will invade old manure deposits, form circular areas. Most of the corrals are fairly large, 50 feet or more in diameter, suggesting herds of good size. In addition, two sheep bedding areas against cliff bases may have once been fenced as corrals or may have merely relied on the sheltered spot to keep the sheep together. These probably had Spanish-American use also, for they are at sites with numerous Spanish inscriptions. However, first use by the Navajo occupants seems almost certain. Lamb pens are scarce, only one being identified.

Ovens.

The Spanish-American *horno* makes its appearance during this period. Only two were noted, however, both at sites that would date largely if not entirely after the arrival of the railroad and the expansion of trade. These are domed structures of rock, the interior surfaces well-reddened by heat and the opening usually oriented in an easterly direction. The two examples from this period are too poorly preserved to permit description in any detail.

One hearth encircled by rocks and about 2 feet in diameter was included in the complex at K7.

Caches.

A cache of pottery along with glass and metal beneath the rocks on the talus slope above Site P seems to date with the period of occupation at the site. Collected by Vivian, the pottery

Stone corral at Site A22.

included three late Trios Polychrome ollas and a bowl sherd, all from Zia, and another olla of Laguna Polychrome or Acoma Polychrome (fig. 40-42).

Storage Platform.

At K7, a sandstone slab set up in a juniper tree probably served as a small storage platform.

Dams.

With peace restored and more efficient tools available in some quantity through trade with the whites, more ambitious construction projects could be undertaken. Documentation indicates work for water storage became a popular activity, since it opened up new range land that could seldom be grazed previously. One of these early dams was recorded on a wash east of Kin Klizhin (fig. 19). Built by Tomás Padilla, probably around 1919, it is 280 feet long, 20 feet wide at the base and 4 feet high. A sandstone outcrop at one end probably served as the spillway, but a portion of the dam washed out and was repaired. The repair has stone facing for greater protection. The dam has since been breached again, probably after its abandonment about 1923 when Padilla was fenced out of the section by a white rancher. The work was done with horse drawn scrapers. While the guide asserted that the project was strictly a Navajo affair, there is some likelihood that the Padillas received encouragement and perhaps even the loan of equipment from the government. The dam was used to store stock water for summer grazing.

Earth dam at Site A18.

Collections.

Indian pottery is still strongly represented on sites of this period. Over half of the sites produced sherds, three having only Navajo pottery, three only Pueblo trade types and two having some of both.

Euro-American goods were even more common. Tin cans and glass were reported for nine sites each, crockery for six, wire on three, with enameled metal, tar paper, and lumber being noted on one each. The aluminum noted for one site is a very recent beer can, however, and not associated with the Navajo occupation.

1880—World War II

A few sites cannot be placed as having their most intensive occupation either before or after the period 1918-20 and have been grouped in this overlapping category. As a whole, they are intermediate in terms of dimensions and features between the preceding and following periods, and would seem to support the delineation of post-Fort Sumner trends based on the analysis of sites assigned to the other periods. The major characteristic, common to all except one site not investigated in detail, is the presence of plentiful trade goods, good evidence of occupation after the arrival of the Santa Fe Railway to the south stimulated the proliferation of trading posts. Traditional information, where available, is limited to the names of occupants. It seems unlikely that this is all the knowledge of the sites held by the local Navajo community, but it is as much as could be easily obtained during the survey. Only eight sites are included here.

Houses.

There are two houses in this group, both at Site A24. House 2, of unshaped sandstone blocks, is a single room structure, measuring about 15 feet by 7 feet. House 4 is partially excavated into a slope and is partially stone walled, again with masonry of unshaped stone. Floor dimensions are 15 feet by 12 feet. Both structures have nothing remaining to indicate roof types, nor is there any evidence of windows. Entry orientations are 74 degrees and 134 degrees. Ash heaps were not identified. Trash, including tin cans, glass and wire, is associated with the occupation of both structures.

Hogans.

There are 16 hogans, all sites in this period having at least one. Of these, 12 are of masonry of unshaped rock (fig. 20), two are wooden, many-legged hogans and two are represented by hogan rings. Floor diameters average 13.4 feet, with a range from 9 feet to 17 feet. Ash heap distances average 57.8 feet with a range from 32 feet to 95 feet. Of the few cases where ash heap direction could be related to the entry, there were two instances of its being to the left of the entry orientation and one of its being to the right. No coal ash was noted at any of the ash heaps, while a wood chopping area was observed at three. A floor hearth was found in one hogan, and stove parts at F3, although not directly associated with any of the hogans, is indicative of use of a stove in at least one of these structures.

Post-Fort Sumner stone hogan, Site A24.

Two of the hogans appear to be ch'indi, one on the basis of Navajo tradition, and one which seems to be a burial site.

There are no tree-ring dates from these hogans. Euro-American trash is specifically associated with 11 of the hogans and was noted on all but one of the sites.

Corrals and Lamb Pens.

Five corrals were recorded, two each at A24 and F3 and one at B5. These average somewhat larger than those of the 1868 through World War I group, most being over 60 feet in diameter. In addition, four lamb pens were recorded, three at B5, and one at F1.

Storage Structures.

A storage bin of stone built against a boulder was noted at Site F3.

Rock Art.

Navajo rock art was abundant at F3 where two elaborate pictograph panels of Ye'i were recorded within a rock shelter, and incised petroglyphs of deer hunting were found on an exposed cliff face. Contemporaneity with the hogan occupation is quite uncertain.

Graves.

A pile of heat-reddened rocks, possibly originally from an oven or a burned hogan, is suggestive of a burial at Hogan 3. The rocks are discolored on one side only, indicating that they were not used to heat a sweathouse.

Collections.

No collections were made at these sites. No Indian pottery of the historic period was observed on any, but Euro-American goods include tin cans, a lard bucket, enameled metal, glass, crockery, wire, and a door from a cast iron stove.

Post World War I—World War II

More sites, 31, were assigned to this time period than any other. Some obviously also had earlier occupation; but if most of the occupations seemed to date from between about 1918-20 and 1945, they were included here. All were probably abandoned by 1945 or shortly thereafter, and occupation during this period was at least sufficiently intensive that structures and features cannot be assumed to have retained the forms they had at an earlier date.

Houses.

Contrary to expectations, houses do not show any increase in popularity during this period, but decrease in proportion to hogans. Twelve houses were recorded. Of this total, 11 were constructed of masonry. Where data are available, two were built of shaped stones and five of naturally shaped rocks. Planks were used in at least two. Vigas were used to support the roof of at least three and probably on others as well. The one wooden house had palisaded jacal walls of juniper posts and pine vigas to support the roof.

Six were one-room structures, two had two rooms, and one had three. One two-room house, House 1 at Site T, faces almost south with an entry giving access to the room on the west. The eastern room was added later and appears never to have been finished. A window on the east side of Room 1 was probably intended for enlargement for use as a door, for no doorway could be defined for Room 2. The other two-room house was originally a four-room structure built by a Spanish-American trader, but only two rooms had been maintained and are probably all that were used when reoccupied by Navajos. The entry was to the southeast and the back room opened only into the front. The three-room structure, House 6 at D5, was in such a ruinous state that no exterior doorways could be identified. Two interior doorways were present, connecting the southeastern room with the west room and the north room. One or both of the houses at this site are believed to have been originally built by Anglo-American cattlemen in the 19th century. How much modification might have been done by the Navajo occupants remains unknown.

Orientations of entries are variable, one easterly, three somewhat south of east (99 degrees to 115 degrees) and one at about 147 degrees. At least two of the exterior entries were supplied with doors, and it is probable that doors were present on all of these structures.

At least five of the houses had windows. House 1 at Site B is reported to have had three windows, two in the east wall, and one in the south (Corbett, 1938). House 1 at T, when a one-room dwelling, had one window each in the east and west walls. When Room 2 was added, two windows were built into the east wall. The houses at A1 and A8 had one window each, in both cases in the south wall. The two rooms with Navajo occupation at C6 had four windows. At least two of these, one facing northwest and one northeast, had been blocked, probably by the Navajo occupants. Room dimensions varied from 10 feet by 13 feet to 13 feet by 30 feet.

Ash heap distances varied from 18 feet to 225 feet, averaging 115.1 feet. Except possibly at D5, these were not places for disposal of trash. Where direction of ash heap could be compared with entry orientations, it was to the north except at C6, where the deposit is so small that it might not have been the main ash heap. Only House 6 at D5 appears to be ch'indi. The presence of a saddle and a pile of rock in Room 3, the north room, suggests use of this location for a burial.

Trade goods were found in association with all houses except that at A20 which was never occupied. Datable collected material ranged in age from post-1860 to possibly as late as 1964, although both are extreme dates, 1934 being the latest definite end date. Materials noted but not collected include tin cans at seven houses, glass at seven houses, wire at four houses, prohibition-era whiskey jugs at three houses, rubber at two houses, leather at one house, stove parts at two houses, car parts at two houses, wagon parts at one house, a saddle at one house, and a bucket at one house. Tree-ring dates were obtained from only one of the houses, that at Site T. These are said to be from logs used originally for roofing House 1 at Site P, but only two produced dates early enough to confirm this origin. The other, dated at 1921v, was probably cut for use at T.

Tradition and documentation are useful in dating those structures, especially since the data from Navajo sources comes from a period when personal memories of the guides can be expected to provide quite reliable information. In addition, some of the sites were included in Corbett's survey of Navajo house types in 1937.

The house at Site B was reported by local Navajos to have been occupied by John Smith, son of Dan Cly, in the 1930's. It was visited by John Corbett (1938), then a student at the University of New Mexico Field School, in 1937. Corbett's brief description identifies it as the home of John Smith and notes "Nobody at home." By this time, most Navajos had been moved out of this part of the Park and the site had probably been quite recently vacated.

Site T is said to have been occupied by *Hastiin Tsékooh*. The site had a long occupation, but precise dates were not established. The guide could recall occupation only in the west room, further evidence that the east room was never completed.

Site Y is said to have been occupied by Dan Cly at least as early as 1904 and to have been adjacent to a corn field. Corbett (1938) visited the site and also attributed it to Cly. He reported only a stone hogan, suggesting that the houses were already in ruins or had not yet been built. The quarter section on which this site is located was alloted to Cly in 1908 (Tract Book, BIA Title Plant.) Cly is said to have moved to this location when he had to leave his home within the National Park in Cly Canyon (Site A), probably about 1936, and to have moved from this site prior to his death about 1957-58. His daughter, Emma Joe, still lived very close to this site in 1974.

Site A11 was occupied by Julian Welito (variants: Julian Werito, Welito, Walito, Ushkatl-nehl-got) who received this quarter section as an allotment in 1909 (Tract Book, BIA Title Plant; Plat Book, Eastern Navajo Agency.) According to the guide, the house was built around 1930 and was abandoned by 1937. Corbett (1938) found John Werito, a son of Julian Werito, in residence in a hogan here or very nearby and did not note any house in this section, although the structure is in good condition and should have been standing at that time. One of Julian Werito's grandsons stated that he helped his grandfather build Hogan 3 at this site sometime in 1945 or 1946. He considers the house "much older" than the hogan. Julian Werito was killed by lightening in 1952, the latest probable date for occupation at this site.

Site A8 is said to have been used prior to Fort Sumner and again in the 1930's, the later occupation obscuring any trace of an earlier use of the site. *Hastiin T'iisi* lived here about 1932, but whether in House 1 or one of the hogans is uncertain. His wife was of the same clan as Julian Werito, so that the proximity of the two sites is not unusual.

The occupant of the house at A20 has not been identified, but the quarter section on which it is located was allotted to Yellow Woman, Welo's wife, in 1909. The guide indicated occupation at the site sometime between 1930 and

1940, and perhaps later. One occupant was Roy Newton, although which structure was his home is uncertain.

Site C1 had a relatively large and intensive occupation, to judge from the remains. It was a summer camp for Tomacito Padilla from 1929 or earlier and was in use during Civilian Conservation Corps days. Padilla is said to have planted crops here in the central portion of South Gap, and his sheep were grazed on top of West Mesa from this site. Tomacito, his son, Tom Padilla and son-in-law, Wellito Wero were living here in 1929. Who occupied which specific structure is not known. Tomacito and his family were forced to move from the Park in 1934. In a letter of complaint, he claimed 52 years residence in 1936 (whether he was dating back from 1936 or 1934 is somewhat vague). In any case, he had apparently lived there since about 1884 (Ta-mu-see-to and others to Senate Indian Committee, 2 Sep 1936, Hearings, 1937). By 1937, the family was again within the Park, living in the main canyon near Casa Rinconada (Corbett, 1938). Tomacito's death has been variously reported, but apparently post-dates 1937. In the probate records of his allotment, the date is estimated at

Navajo forge in Mariano's Trading Post, dating from reoccupation of Site C6.

between 1939 and 1944 (NM-OR-205, Eastern Navajo Agency). A student map prepared in 1941 shows three round structures, presumably all hogans, at C1 with two sweathouses well removed to the north (RFG, 1941). This site is said to have been reoccupied during World War II. The family was permanently removed in May, 1948 (SWM Reports), and the structures were razed at that time or somewhat later.

The house at C6 was originally a four-room trading post built by an unidentified Spanish-American. It was occupied by *Hastiin Ts'osí* ("Slim Man") of the *Kįįyaa'áanii* Clan after the trader left. *Hastiin Ts'osí* is remembered as a wealthy stockman and is probably the man identified as Delgadito in documentary sources. Probably at an even later date, Alfredo Cayadito operated a smithy in the front room (fig. 21).

Again at C9, the history of the house as such was not obtained, but the site was used by Wellito Wero from about 1915 until the Navajos had to leave the Park in about 1936. The 1941 map shows him living north of the Escavada (Ibid.), while Corbett (1938) found him just south of that arroyo four years earlier.

The houses at D5 belonged to *Hastiin Táal-akin* or Wello (variants: Welo, Wala, Wero, Waro, Old Wello, Ta-be-kin.) While said to have been built originally by Anglo cattlemen in the 19th century, they are on land allotted to Wello in 1909. Wello claimed to have occupied a site within his allotment for 29 years at that time (Tract Book, SW Title Plant), but whether at this specific site is not stated. His occupation can be reasonably projected back to 1895 on the basis of data from the Hyde Exploring Expedition (Brugge, 1979). Wello's son is said to have lived in House 6, possibly the latest occupation of the site. In 1927, an effort was made by the Bureau of Indian Affairs and the National Park Service to arrange an exchange of the allotment because it included a part of Peñasco Blanco ruin. Also on the allotment, however, were a portion of the family's cornfield, and two houses, one described as having six rooms and the other, four rooms.

The houses were quite obviously those at the site, but only the smaller structure was reported to be in good repair, suggesting that the larger had already been abandoned as a dwelling (Roblin to Stacher, May 10, 1928, NA, RF75, BIA, 17085-1928-307.2 EN). In 1934, Willeto Wero, a son of Wello, was farming on the allotment (Stacher to Julian, 13 April 1934, NA, RF79, NPS, Mon., Chaco Canyon, Gen., Part 9).

Collections from the houses are generally compatible with the temporal assignment. House 1 at Site B produced a sherd of a Coca Cola bottle with a 1923 date and a 1934 Texas license plate. Crockery sherds from a jug, while datable typologically only as post-1900, are of a type of container said to have been popular for whiskey during Prohibition. At House 1, Site T, only tin cans were noted. At House 3, Site Y, trash included tin cans, glass, lumber and wire, as did the trash at House 1, Site A1. The latter also yielded sherds of a Prohibition-era jug. House 1, Site A8, produced similar trash—tin cans, glass, wire, a door, the tin lid of a chewing tobacco can, and sherds of a whiskey jug. At House 6, Site C1, only tin cans, glass and wire were noted. At C9, glass and rubber were noted at House 1 and a saddle at House 6.

House 6, at D5, had associated plentiful trash, extreme possible dates for tin cans and glass ranging from 1860 to 1964, but suggesting clustering from about 19[illegible]7-1934. The latter date is supplied by a copper souvenir bracelet from the Chicago World's Fair of 1934.

Hogans.

Fifty-two hogans show that this style of dwelling enjoyed continued popularity, perhaps even an increase in use, between the World Wars. Types were as follows:

Stone	36	(69 percent)
Cribbed-log	1	(2 percent)
Many-legged	1	(2 percent)
Ring only	14	(27 percent)

The high proportion of hogan rings could indicate an increased tendency to salvage materials from older structures for use in new buildings, but might also be a factor of the more recent date of the sites, with less chance that traces of dismantled structures would have been obscured by erosion, deposition, or the disturbance of later occupation.

A comparison with the hogan types noted by Corbett (1938) is of interest in this regard. Excluding houses, which he termed "square hogans," his types were as follows:

Stone	47	(44 percent)
Many-legged	28	(26 percent)
Cribbed-log	33	(30 percent)

It would appear that the hogans from which materials were most regularly salvaged were wooden structures, as would be expected in a region where trees are so scarce. It should be noted that Corbett's survey differed somewhat both in area covered and in emphasis given to particular locales, which probably accounts in part for the lower proportion of stone hogans. Despite this difference and the fact that his survey included hogans occupied or only recently abandoned in one year, the suggestion that most of the hogan rings represent what were originally wooden structures seems good.

The increase in the use of shaped stones for masonry is not proportionally as great as in houses, this feature being noted for only four hogans. Doubled walls of masonry two stones thick appear only in one hogan. Windows were not noted at any of the hogans. The lack of windows is again a factor of preservation rather than original absence, for Corbett did record the use of windows in a number of hogans in 1937.

Entry orientations cluster more toward the east than earlier, ranging for hogans from 62 degrees to 129 degrees and averaging for all dwellings, whether hogans or houses, at 81.3 degrees. While there was little evidence for the use of doors in the hogans recorded archeologically, Corbett notes the use of both doors and hung blankets for closing the entry. Assuming that he did not misinterpret blankets hung outside doors at hogans where ceremonies were in progress, which does not seem likely, both methods of closing entryways were in daily use in 1937.

Floor diameters ranged from 11 feet to 20 feet, averaging 13.4 feet. Stoves or stove parts were noted at eight sites and coal ash in ash heaps at eight sites. At Site K, the stoves were homemade from oil drums. Wood chopping areas could be distinguished at only five sites, but wood was doubtlessly the usual fuel. Ash heap distances ranged from 20 feet to 200 feet and averaged 65 feet. Of those hogans for which the orientations of the entry and direction of ash heap can be compared, 17 had the ash heap to the left of the entry orientation, two to the right and one about straight out.

There is only one tree-ring date for a hogan of this period, Hogan 1 at Site W. This is 1890+vv, not a cutting date and far too early for the known occupation.

As with the houses of this period, Navajo tradition and historical documentation are especially valuable for dating. Again, the data are more often recorded for a site in general than for specific structures. Dates are not as secure as a historian would like, but are exceptionally good compared to most archeologically derived dates.

The hogan at Site A was occupied by Dan Cly's family in the 1930's. A report in 1933 mentioned two hogans in this vicinity, this doubtlessly being one of them (Julian to Commission, GLO, Feb. 1933, CCNM Files). Corbett (1938) named Ella and Emma Cly as the residents at the time of his survey. The lack of any indication of the structure on the 1941 student map in so obvious a location is almost certain proof that the structures had by then been razed by the Park Service. Cly is said to have had a cornfield near the hogan, a statement that is confirmed by Judd's map showing a dam, two fields and a structure present in 1925 (Judd, 1954). The building is shown by a rectangular symbol and may have been John Smith's house rather than the hogan.

Site C in Gallo Canyon is said to have been occupied by Rafael Mescalito's family in the 1930's. A dispute between the Navajos living on Section 22, undoubtedly the Mescalitos at Site C and the Georges at D just across the Gallo, and Edward Sargent was arbitrated by Bureau of Indian Affairs officials in 1936.

National Park Service custodian Thomas C. Miller attended the negotiations and reported later that "the Indians have lived there all their lives, have their houses and farms there" (Miller as quoted in Pinkley to Director, 1 May 1936, SWM Monthly Reports). The site was not noted in either 1937 or 1941, but Corbett's map (1938) does not show the road up Gallo Canyon, suggesting that he did not investigate this area. The 1941 map does indicate the road, and it is probable that the hogans were no longer standing by that year.

The occupants at Site U could not be definitely identified by the guide, but he thought that Charlie Atensio, Sr., had resided there. The hogan does not appear in Corbett's survey, but is noted on the 1941 map.

Site K on Chacra Mesa was a winter camp used by Willie George and Rafael Mescalito, apparently during the same period that they farmed on the Gallo and across from Wijiji in the main canyon. It is directly south of Navajo George's old allotment which he had received in 1909 and which had been cancelled in 1910

(Plat Book, Eastern Navajo Agency). It probably had extended use. It is still sporadically visited as a hunting camp. The building of a fence between the site and a nearby spring in 1934 made it impractical to range stock from the site, however, and it was abandoned at that time as a winter camp. One hogan, probably Hogan 3, is ch'indi. Hogan 7, a hogan ring of rather small size with an ash dump considerably closer than at the other dwellings, was not known to the guide and perhaps dates considerably earlier than the standing hogans.

Site L was at a farming site used at the same time as Site K by Willie George. Site M was another winter camp of the George family used in the 1920's. The site was apparently first settled about 1922-23 when the family held an emergency Enemyway ceremony and was used for some years thereafter. Site N is another attributed to the George family. Willie George built the hogan and made use of the site between 1915 and 1930. As a single hogan site, it apparently was used as a sheep camp, while older family members stayed at a more permanent winter camp such as Site M. The hogan at Site O was also Willie George's, probably another sheep camp.

Hastiin Tsékooh is said to have occupied Site R in the early 1920's. He left the site after reaching some sort of agreement with a white rancher, Edward Sargent, moving east to Site S where he already had a winter camp. No reason is known as to why this canyon bottom location was chosen for a winter camp, contrary to the usual pattern of movement to mesa sites for winter. As noted above, Site T is also attributed to *Hastiin Tsékooh*, as is Chaco L1, another canyon bottom site near his cornfield where he sometimes lived throughout the year. It may be that he felt winter occupation necessary in this part of the canyon in order to keep Sargent's shepherds off the family's lands during that season.

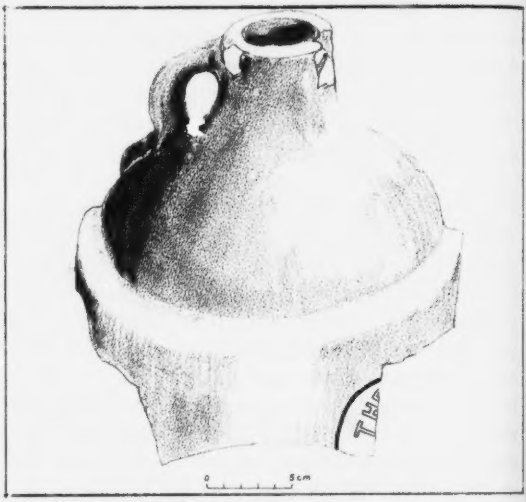
Site W was built by Willie George and used for only one year around 1924. He, his sister, and Charlie Joe had the three hogans at Site X, another dating about the mid-1920's.

Site Y was long a summer camp used by Dan Cly and is the place to which he moved when he had to leave park lands. The guide estimated that the site had use from as early as 1904 until about 1959.

The occupation at A1 has been summarized above under "Houses," as has that for A8 and A20.

Joe Roman, a well-known singer, lived at A10 where he had a farm, implying that the site was primarily a summer camp. His occupation is said to have extended from about 1890 until about 1930 when Sargent forced him off the land.

A23 was occupied by the Padilla family around 1919 as a winter camp. Length of occupation has not been established. Site A26 was also a Padilla homesite, this with some year-round occupation. It is said to have been in use from about 1910 to about 1937.



Prohibition era whiskey jug.

At B1, the modern Cluster IV on the canyon floor was a summer home for Katherine and Rafael Mescalito. Mescalito build Hogan 24 while his daughter, Mrs. Charlie Atencio who was born about 1922, was still a child. The family moved out in about 1936, but continued to range sheep here into the 1940's.

The history of C1 is presented above under "Houses." C3 was occupied by a man remembered by the name of "Mr. Lilly" in about 1930-31, but again the full range of occupation was not learned.

Hogan 5 at C5 was occupied by *Hastiin Tsédáá'tóh* and his wife. The last two sites with hogans, C9 and D5, are discussed above under "Houses."

The number of hogans producing Euro-American trade goods of various types is as follows:

Tin cans	38
Glass	34
Window glass	1
Wire	20
Crockery	9
Enameled metal	9
Stoves and stove parts	7
Homemade stoves	2
Wagon parts and equipment	8
Riding equipment	1
Car parts	1
Rubber	6
Leather	6
Lumber	3
Roofing paper	1
Buckets	1
Metal bed frames	1
Dry cell batteries	1
Kerosene lamps	1
Metal tools	1
Aluminum	1
Miscellaneous metal	2
Manufactured toys	2

The most significant difference that appears between hogans and houses in these collections is the high proportion of whiskey jug sherds (fig. 22) found at the houses, something entirely absent from the hogans, even when these are included in the same sites. While glass collections were not made on every site where this material occurred, and contents of the bottles represented is uncertain for most of the glass collected, two portions of bottles used for alcoholic beverages were identified from hogan associations—one, a beer bottle dating between 1903 and 1930, the other, a whiskey bottle from between 1903 and 1917. In comparison, two houses produced sherds of whiskey bottles, and one of these also had beer bottle sherds. The latter, C6, also had Spanish-American occupation, and it is not possible to separate Spanish and Navajo trash with any degree of assurance.

Although far from a random sample, the data suggest a higher consumption of alcoholic beverages by house dwellers than by hogan dwellers, most clearly for the period of nationwide Prohibition. Not only does this correlate well with the expectable greater acceptance of Euro-American introductions, but it would suggest that the more acculturated households had a stronger male dominance than the less acculturated. The evidence does not necessarily indicate less drinking on the part of hogan dwellers, but does show less consumption of alcohol at home. Window glass was noted only in association with one hogan. While it was noted for only one house, proportionately the data from trash deposits conforms to that from architectural remains in demonstrating that windows were more common in houses than hogans, again a measure of greater acceptance of Euro-American traits by house dwellers. That windows were used far more frequently in houses than in hogans is confirmed by Corbett's (1938) data. Of 26 rectangular structures for which he gives information on windows, only one lacked this feature. For round dwellings, however, he noted windows for only 15 and no windows for 41.

Some Indian pottery was found in association with hogans, but it was so rare that its absence at the few houses recorded cannot be regarded as significant.

There are only two collections, three sherds of Zia Polychrome from T and three sherds of Acoma Polychrome from X.

Other items found at hogans include fragments of gypsum from Hogan 1 at A and Hogan 1 at C. This is said to have been used for whitening wool used in weaving.

Tents.

Two tent sites were found. Both lack any indication of the tent itself, but have fireplaces and chimneys built of sandstone blocks and slabs set in adobe mortar. These measure 2 feet to 2 1/2 feet square at the base and stand 4 feet to 4 1/2 feet high. In each case, the fireplace opens to the west. A tent erected with its entry located so as to permit use of the hearth for heating the tent would have been oriented easterly.

Both are at sites said to have been occupied by *Hastin Tsékooh*. The guide asserted that they were built and used by Navajos. The custom is of Spanish-American origin, however, as described by Parish (1962) for the early years of this century:

> Every few miles as you ride over the range, you see what they call A CHIMNEY CORNER. These are built of stones by the Spanish herders and greatly resemble the old-fashioned fireplaces.

In the winter the herders pitch their tents close to these open fireplaces, so that with dry cedar and pine knots which they bring down from the mountains on their burros, they can start a fire on short notice.

Ramadas.

Ramadas were also rare as identified structures at abandoned sites, with only three being noticed. This might well be due to the fact that they were constructed of wood, and once the wood was removed, little trace of them would remain. Dimensions were as follows:

Site	Size
R	33 feet by 20 feet
T	13 feet by 8 feet
C3	?

Ash Heaps.

Two ash heaps that could not be definitely associated with structural remains were noted. In each case, the former presence of some sort of a dwelling or camp structure must be inferred, but its nature and location relative to the ash heap are not apparent in the surface evidence. That at C1 contained coal ash and associated trash included tin cans, wire, rubber, crockery and glass, indicative of no great age. At C9, associated trash included glass and a round nail. Absence of structural remains might suggest deposition from a tent or from something more substantial that had been completely dismantled.

Corrals.

Twenty-five corrals were recorded. Of those well enough preserved for determination of building materials, 17 were of stone, 6 of wood and one had a wire fence. Generally round, oval or D-shaped, depending somewhat on the terrain, they vary widely in size, from as small as 10 feet by 20 feet to a large example 150 feet by 150 feet. There are traces of several rectangular corrals at C6, but which are attributable to the Navajo occupation and which to the Spanish-American is uncertain. Some perhaps served both. All corrals are at sites with either hogans or houses.

Lamb Pens.

Lamb pens continue to appear in this period, seven being recorded, often in association with corrals. By about 1931, nearly all Navajos in the area were herding their rams separately and allowing them to run with the ewes only in December, so that few of these small structures are likely to date much beyond this time (Hearings 1937).

Chapter House.

A new type of structure, indicative of the developing political organization of the tribe during this period, is represented by one building which was a chapter house or community meeting place. Chapter organization in the Eastern Navajo Agency began about 1928 or 1929 under BIA sponsorship (Annual Report, 1929, NA, RG 75, BIA, Narrative and Statistical Reports, EN).

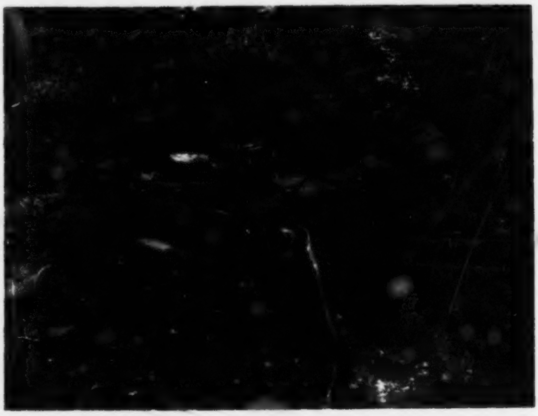
Old Pueblo Alto chapter house, Site C5.

Early chapter meetings were often held in the open, but within a year, five chapter houses had been built in the Eastern Navajo Agency area (Annual Report, 1931, Ibid.) By 1930 at the latest, chapter meetings were being held at Setzer's Store, Site C5 (Stacher, Monthly Chapter Meetings, N.D., NA, RG 75, BIA, Narrative and Statisical Reports, EN).

The chapter house at C5 is a rectangular stone building constructed of shaped sandstone blocks and slabs (fig. 23). Oriented 188 degrees, or nearly south, it measures 30 feet south-north by 12 feet east-west. The entry has a frame of sawed lumber with a log lintel and undoubtedly once had a door. There is a stone step outside the entry. The interior is one large room with a roof of planks supported by vigas crossing east-west and sloping downward slightly to the west.

Holes for stove pipes appear in the center and in the southwest corner of the roof. The interior of the walls are plastered with adobe. Windows 2½ feet high and 5 feet wide, having two panes, are in the center of the east and west walls. An ash dump is located 110 feet from the entry at 140 degrees. It contains wood ash, charcoal, metal, glass, and bone and is about 10 inches high and 15 feet in diameter. Other trash associated with the structure includes tin cans, glass and crockery, none of which was collected. Construction is said to have been prior to 1933 by *Hastiin Hastł'ishnii Ntł'aaí* ("Left-handed Mud Clansman") who used it as a home, use as a chapter house commencing about 1933. The large size of the single room would seem to have been intended for meetings rather than residence. A break in the masonry indicates that the north end of the building was the original part of the structure. It was probably this northern portion that was the residence originally, the south wall being removed and a major addition made to increase the size for use as a chapter house. The hole for a stove pipe in the corner of the roof was probably that used when only the original portion existed. Breaks

Domed bread oven at Site C.



Flat-roofed bread oven.

Modern bread ovens of the flat-topped variety at Enemyway site north of Chaco Canyon.

Discard pile of sweathouse, Site A10. Structure located at the depression in foreground.

in the masonry of the north wall also show that there was once a window there, again probably a feature from the period of residential use.

Ovens.

By this period, the use of the *horno* style of ovens was widespread. A total of 25 ovens at 11 sites was recorded. Most are at habitation sites with clear association with the occupation of hogans or houses, but one site, C2, had no structures other than four ovens. It was said to have been a favorite locale for the second night of Enemyway.

All ovens are of sandstone. They range in diameter from 2 feet to 7 feet, most however, being between 3 feet and 4 feet. Entries, where discernible, are easterly. Oven roofs may be domed or flat (fig. 24-26), examples of both being observed, but most were so poorly preserved that the style could not be determined.

Granaries.

Only one granary, a stone structure with a wooden roof and about nine feet in diameter, was identified. It was at Site K.

Sweathouses.

Relatively few sweathouses were recorded, only three, one each at Sites C, A1 and A10 (fig. 27). All conformed to traditional Navajo usage insofar as features could be observed. The failure to identify more sweathouses in such a large number of sites may be due to a tendency during this period to locate these facilities at a greater distance from dwellings. The 1941 map shows Tomacito's hogans (Site C1) with two sweathouses nearly one-half mile to the north. The only other sweathouse on the map is not close to any Navajo residence. Corbett (1938) did not see any of the sweathouses that must have existed near the dwellings he recorded. It is possible that a tendency for a large extended family or a small outfit to share a single sweathouse when several families live in relatively close proximity developed during this period. This sort of pattern has been noted by the author in the Pueblo Colorado Valley in Arizona and exists in some Western Apache communities where settlement has become relatively sedentary and concentrated. As the population density increases, the number of localities that are convenient yet sufficiently isolated to provide privacy become fewer, making such an adaptation a very practical one.

Rock Shelters.

The use of rock shelters declined during this period. One, at Site D, was said to have been used as a place to dry corn. Another, at K, was used as a sheep bed.

Enemyway Shelters.

The rather lightly constructed conical Enemyway shelters are seldom identified in archeological remains. A rather poorly defined circle of sandstone slabs, about nine feet in diameter, at Site M, is though to be the remains of such a structure, local tradition telling of a ceremony of this sort held at the site about 1922-23.

Roads.

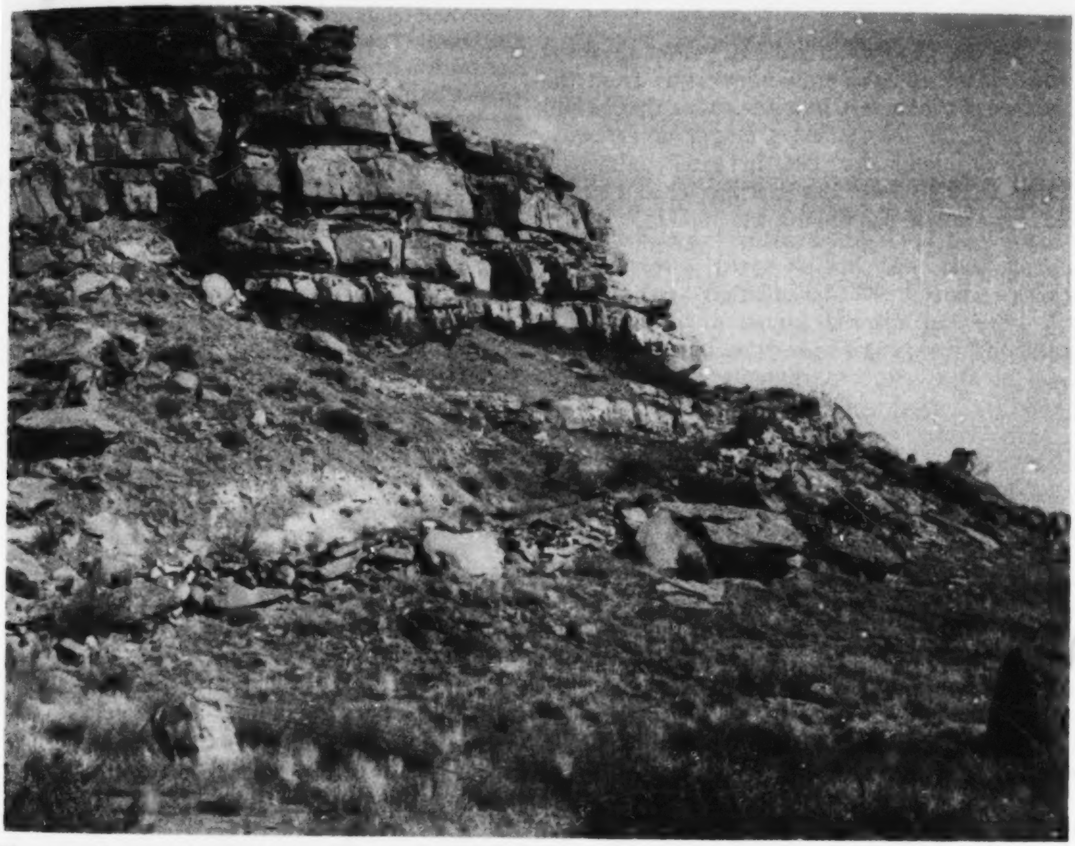
Roads for use by wagons and even trucks increased during this period. Only one, at Site T, was recorded as a site feature. In this case, considerable work had been invested in excavation and building a retaining wall so that vehicular traffic could reach the house located on a low bench on the talus slope. Several wagon roads in the region which were not recorded as sites (fig. 28) probably reached their greatest development during this period, but were ultimately abandoned as fencing cut off various access routes. Most of these lead to homesites on the northeast flank of Chacra Mesa which have also been abandoned for the same reason.

Trails.

Much trail construction was accomplished by Civilian Conservation Corps and other labor programs of the Depression era within the Park, and most trails observed seem to be assignable to this origin. One horse trail, at Site X (fig. 30), is well outside the Park and leads directly to the hogan area over a steep rocky slope. An elaborate retaining structure of logs and brush was probably originally well covered by soil. It is unlikely that this ramp was wide enough to give access by wagon to the site, but it would have allowed horses to be brought in.

Cairns.

Three cairns were found, one each at Sites D, A20, and A10. No functional reasons can be given to these rock piles.

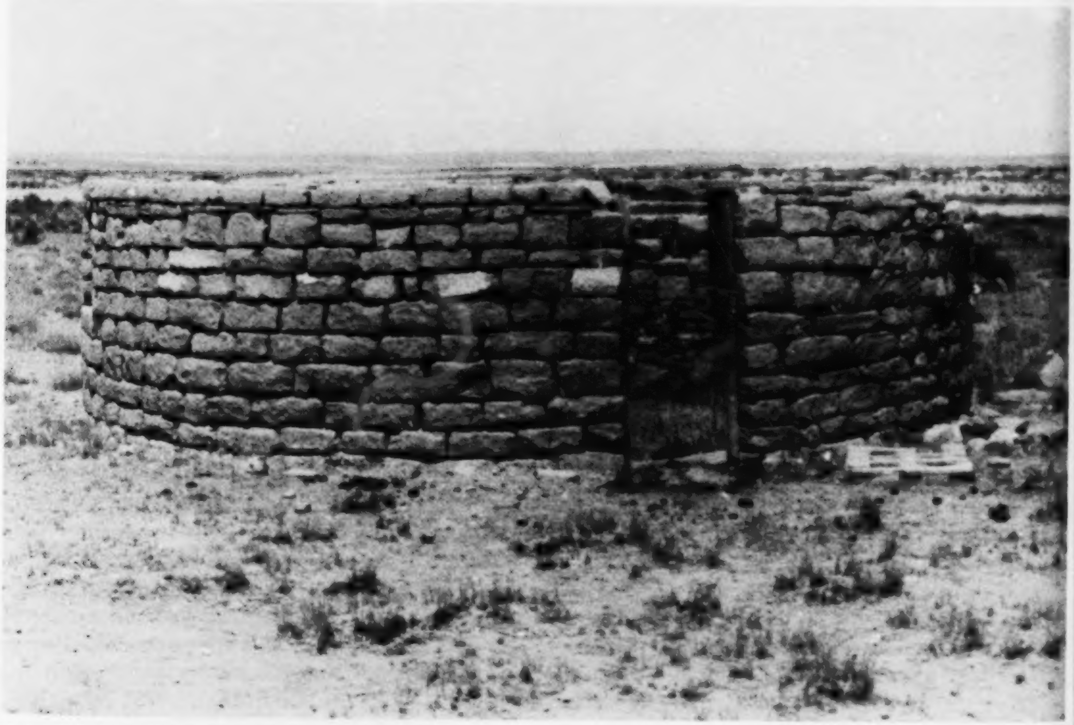


Wagon road ascending the base of Chacra Mesa, Site B3.

Quarries.

At C4, deposits of red and yellow pigment were obtained by simple excavation from the surface of the slope. One guide stated that he had gathered for his father, a singer of Evilway, these pigments for use in sand paintings. Osborn (1939) describes this deposit and others having similar use during the 1930's:

> Ochre and rouge are notoriously plentiful throughout the Navajo Reservation. In fact, the Navajo, according to two Jemez Indian informants, trade colored earths to the Pueblos today and profit from a virtual monoply of some of the brighter shades. . . . the best and most varied exposures of colored earths occur on the extreme jutting point of the west walls of the reentrant in which are the Wetherill coal mines. Here is vermillion, yellow, orange and a deep purple. . . .



Hogan of dressed sandstone blocks, Site A13.

Miscellaneous.

A few miscellaneous structures of uncertain use were also found at these sites. At D is an oval stone feature measuring six and one-half feet by six feet with an entry to the southeast only about six inches wide. Possible functions include a lamb pen, storage or child's play. At Site R, a rectangular feature measuring about 33 feet by 20 feet was indicated by two juniper posts and a few rocks. A corral or a ramada are the most likely prospects here.

Rock Art.

Navajo rock art seems to have declined in importance during the period, perhaps due to the competition of other media. At Site D is a petroglyph of a dance, probably intended to represent a Ye'i, but looking much like an Apache Mountain Spirit dance (fig. 31). Other rock art at the site is less definitively Navajo and many include work by whites as well as Anasazi. One incised horse (fig. 32) is probably of Navajo production. However, a third panel at this site includes incised lines and geometric figures of possible Navajo origin.

Collections.

Trade material was abundant on most of these sites. On the basis of field notes and materials collected, the following numbers of sites had the listed materials present:

Tin cans	25
Glass	26
Crockery	14
Wire	14
Miscellaneous Metal	16
Leather	8
Rubber	7
Cork	1
Plastic	1
Aluminum	1
Wagon parts	8
Horse gear	3
Car parts	4
Stoves	8
Lumber	9
Roofing Paper	1
Tin foil	1
Navajo pottery	2
Pueblo pottery	4
Jicarilla pottery	1

Post World War II

The emphasis on the past led to the recording of relatively few sites postdating World War II, but the few included in the survey, while far from adequate to provide any statistical significance, do suggest the trends established shortly after the war, when Euro-American influence became exceptionally great in matters of material culture. Data are available for only four sites.

Houses.

While only two houses were recorded, these make up a third of the number of permanent dwelling structures. Both are of shaped sandstone blocks. Neither was well preserved, one, at Site Z, having been burned because of a death taking place within, the other at A13 having been dismantled. The former was not investigated in detail, but the presence of a window in the south wall was noted. The latter had been a one-room structure with at least three windows, three window frames still lying on the ground along with other debris. Furnishings had included at a minimum a wooden cot, a chair and a metal stove. Evidence of both a coal pile and a wood chopping area were found about 53 feet easterly from the remains. The ash heap is 73 feet to the east, three feet high and 20 feet in diameter, and contains coal ash, charcoal, bits of trash and unburned bone. Trash at Site Z included an abandoned pickup truck and a Ford car. At A13, there are associated with the house tin cans, glass, wire, a tin wash basin, rubber tires and car parts and the cot, chair and stove noted above. Site Z is said to have been occupied by Antonio Trujillo, the house having been built about 1948-49 and burned after Trujillo died there about 1968. It is on unallotted land.

House 1 at Site A13 was occupied by Charlie Atencio about 1954, but the length of occupation was not learned. The land upon which it is located was allotted in 1908 to Es-sken-e-pah who was at the time an eight-year-old girl. Just prior to World War II, Charlie Atencio had a number of dwellings in the vicinity (Corbett, 1938; RFG, 1941), but had not yet settled at this site.

Hogans.

The four hogans post-dating the war make up two-thirds of the dwellings recorded. Two were built of shaped stone (fig. 29), of one, only a ring remained and the last was entirely obliterated, only the ash heap remaining to show its former existence. For the three with some structural evidence surviving, diameters average 18.3 feet, ranging from 15 feet to 20 feet. Ash heap distances average 71.6 feet, the range being from 65 feet to 75 feet, both house and hogan data being combined. Entry orientations are easterly, averaging 84.7 degrees. One stone hogan has doubled walls and a door. The other, which was never finished, has a plank door frame and two apertures for windows. Window glass was observed at the hogan ring. Coal ash was in the three ash heaps. Trash at all four hogans included tin cans, while other trash noted at fewer than four hogans consisted of glass, wire, a wagon wheel hub and other wagon parts, a car and a World War II-style army boot.

One of these hogans was in use at Site A4 when Jake and Opal Trujillo lived there. Coal for the site was obtained from a deposit about a quarter mile to the north on a hillside. The land on which the site was built was allotted in 1909 to Willito's wife, A-de-tso-see (*'At'ééd Ts'ósí*, "Slim Girl"). Prior to the war, Antonio Trujillo and John Werito had dwellings nearby (Corbett, 1938), but Jake Trujillo apparently did not settle here until after 1941 (RFG, 1941).

Horse trail over slickrock, Site X.

Petroglyph of a dancer at Site D.

The other three hogans are all at A13. Specific occupants were not identified.

Tents.

The guide stated that a tent had been erected on the west side of Site A13. No trace of it was found. The site was abandoned when Charlie Atencio's daughter died in this shelter.

Corrals.

Two corrals were recorded at A13 and one at A4. Sizes were moderate, averaging 35 feet in diameter. Two were circular and one rectangular.

Chicken Coop.

A small stone structure at A13, rectangular and measuring eight feet by six feet, was identified by the guide as a chicken coop, the only example of this kind of building noted at a Navajo site during the survey. The entry was oriented to the northwest in keeping with the Navajo lack of concern for the orientations of structures used for domestic animals.

Ovens.

One oven was recorded, this at A13. It was of the usual *horno* style, 2¾ feet in diameter and oriented easterly.

Quarries.

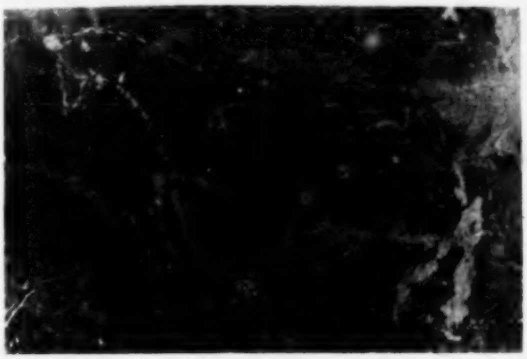
Site A16 is a deposit of *dlesh*, the bentonitic white clay used by the Navajos in certain foods and as a pigment. Dating at this site is based entirely on the collection of some of the clay in 1974. A long history of use of this kind of clay, obtained from the plentiful deposits along the Escavada Wash, may safely be postulated, but details of the use of any specific location through time is not possible without much more detailed traditional data.

Other Navajo Sites

A number of Navajo sites cannot be assigned securely to any of the periods described above or are lacking in data sufficient for analysis.

Two fortified sites with masonry that would appear to be of Navajo origin were recorded, but neither tradition relating to their use nor collections that would help date them were obtained.

One, G8, is in a rock shelter in the head of a small rincon on the east side of a canyon draining the northeastern side of Chacra Mesa, not far from the main canyon but well hidden from view from that direction. Access to the shelter is possible at only one place from the top of a steep talus slope and here only by the ascent of a 12-foot cliff. While not a difficult climb, it requires the use of both hands and would leave any enemy defenseless until he reached the top. A low rock wall about one and one-half to two feet high runs along the rim of the shelter to the north from this entryway, while on the south, a wall about four feet high extends, curving inward to the rear wall of the shelter and being supplied with loop holes. Farther south in the central part of the shelter is a semicircular structure built against the back wall.



Horse petroglyph with brand at Site D.

Across and up the canyon from the side canyon in which G8 is located is a small area fortified with rough rock walls on the top of a large slump boulder at the base of the cliff of the main canyon. The defensive wall is so roughly built that it is difficult to see from a distance. Deliberate camouflage is probable, for the site commands a good view both up and down the Chaco.

Access is by way of the narrow crack between the cliff and the boulder. One end of this crack is walled up with good masonry and a ramp of soil and rocks filled behind this. From here, it is possible to climb diagonally upward in the opposite direction to the top of the crag. This was recorded as G9.

Both sites are obviously from a time of warfare. The walling up of the crack at G9 is in a manner very much like that at E1, although for a somewhat different purpose. As defensive retreats, rather than habitation sites, they did not receive any accumulation of trash. Although almost certainly of Navajo origin, they cannot be dated more precisely than pre-1868.

Three sheep camps doubtlessly also had Navajo occupation. Site I, described in detail with the Spanish-American sites, has both Navajo and Spanish rock art, but there is not sufficient information available to date the Navajo use. A small stone corral at F8 is located among jumbled boulders well up a talus slope, a positioning that only the Navajos might be expected to choose. It measures about 22 feet by 20 feet and there is one ax-cut piece of juniper on the site, but nothing to date it well. C8 is a site that is said to have been used by Navajo George as a sheep camp around 1915-16, but no physical remains could be discerned. Either the guide was mistaken as to the exact location or such evidence as might once have been on the ground has been removed by erosion.

At F4, a small squarish structure of rock, measuring about 3 feet by 3 feet, is of uncertain origin, but most likely Navajo. Nearby Navajo rock art seems to cover a long time span. At F6, Navajo rock art is associated with a spring. No date can be assigned.

The Euro-American Sites

All Euro-American sites recorded on this survey date after the Navajo return from Fort Sumner. While various military expeditions are known to have crossed the region earlier, the only evidence on the ground of their campsites seems to be some inscriptions left by the members of a supply column in the 1850's. Military camps had very ephemeral occupation, and any goods discarded by the soliders were sufficiently novel for later retrieval by Navajos spying on the invaders. Inscriptions will be considered separately from sites with more elaborate features, but will be noted when present in the descriptions of the more intensively occupied sites.

For purposes of analysis, Spanish-American and Anglo-American sites are considered separately here, but it should be noted that distinction between the two on typological grounds is generally not possible. Reliance has been placed primarily on traditional information obtained from Navajo guides to separate the two ethnic groups, and there is further reason to suspect that some of these sites had occupation by both, in some cases sequentially, and in some, simultaneously. It is probably more likely that a site classified here as Anglo had biethnic occupation than those included under the Spanish label, since the Americans were more likely to have hired Spanish-Americans than vice-versa. Both situations are documented in the historic record, however. On the other hand, a site occupied only by a Spanish-American sheepherder who was employed by an Anglo rancher presents conceptual problems that are of interest, but that cannot be easily resolved by simple taxonomic means. To place the problem in a context that will be more familiar as an archeological problem, assume, as some authorities have asserted, that the Hosta Butte and Bonito Phase populations of the Chaco were ethnically distinct peoples and that the Bonito Phase people were in some way dominant. A field house occupied by a Hosta Butte family doing farming that was in some manner under Bonito sponsorship would probably be indistinguishable from any other Hosta Butte field house. Similarly, a Spanish-American sheep camp, whether occupied by an independent stock owner, by a *partidario* for a Spanish owner or by an employee of Anglo owner, is still a Spanish-American sheep camp and the material objects available to the occupant are very much the same in each case. Navajo guides cannot be expected to recall the culturally foreign arrangements that existed among whites in the region even when they or their ancestors may have been aware of them. Even other whites were often poorly informed in this regard, for many business relationships included covert agreements designed to give advantage over competitors.

Where data other than Navajo memory exist, these are usually in the form of inscriptions on rock surfaces, a type of evidence that can be produced in a very short period of time and the full significance of which is often quite problematical. A passing traveler could as easily have left an inscription as a long-term resident.

Spanish-American Sites

Most Spanish-American sites are sheep camps. Sheepherders moved with great frequency and left little to indicate their passing, so that the small number of sites recorded, 13, is likely but a very small fraction of the actual total. Although some Spanish-American ranch structures are documented historically, none were identified archeologically. Only trading posts were noted as major permanent structures.

Trading Posts.

Two Spanish-American trading post sites were recorded, A3 and C6 (fig. 33). At the first, no physical remains could be found, and it is presumed that active sand dunes at the site have completely obscured whatever traces exist. The store is said to have been rather small and built with palisaded log or jacal walls.

The other trading post was a stone structure, built apparently sometime in the late-19th century, and served also as the trader's home, although functional differentiation of the various rooms is not entirely certain on the basis of surface evidence. All rooms measure about 12 feet by 23 feet in interior dimensions. The two front or southeast rooms were built first as shown by wall abutments. The northeasternmost of the rooms has an entry to the exterior oriented at 142 degrees. There is a window in the northeast wall and another door in the northwest wall, the latter now opening into another room, but no door connecting with the room on the southwest. The room on the southwest is so completely collapsed that no data is available as to the location of entries or windows, but it did have a fireplace against the center of the northwest wall. Of the two rear rooms, that on the north was added first, possibly shortly after the construction of the front rooms. It has no access but through the front rooms, but has one window each in the northeast and northwest walls. The final addition, the southwest rear room, was the last built. It also has collapsed, but evidence of an entry from the exterior is found in the northwest wall. A small platform in one corner of the northeast front room is said to be a later Navajo addition as part of a forge.

Navajo tradition credits the building of this structure to a Spanish-American trader, but his name is not remembered. He is said to have been the first trader at Pueblo Pintado except for a small operation that was conducted in some rooms of the Anasazi ruin which specialized in importing whiskey from Cabezon, also conducted by Spanish-Americans. The stones for the walls are said to have been taken from Pueblo Pintado, suggesting that the trading post may have been a direct outgrowth of the earlier business. Just when the post ceased business has not been determined, but the scarcity of documentation is indicative of a relatively early end date. The reoccupation by the Navajos may have been immediate, but whether the trader sold his building or merely abandoned it is not known.

Mariano's Trading Post, Site C6.

Trade goods on the site range in date from possibly as early as 1880 to the 1930's, the greatest concentration being between 1900 and 1920. Surface materials may be mostly derived from the Navajo occupation.

No white settlers were in this section in 1882 when the first survey was made (Plot of T20N, R8W, BLM Office, Santa Fe.) A Thomas Hye who had a store at the "Chaco ruins" in 1889 was probably doing business in the ruins of Pueblo Pintado to judge from such geographic descriptions of his place as exist. He was reported to be engaged in bootlegging (Crawford to Attorney General, 25 Apr. 1890, NA, BIA, RG 75, L 1087, FM 15104, encl. 1; Hye to CIA, 11 Dec. 1890, NA, BIA, RG 75, L 1159, FM 39022/90.) A map of the area made in 1906 shows what is almost certainly this site as "Mariana's Store" (Shaler and Campbell 1907: Pl. XXII), probably an Anglo misspelling for Mariano. This was probably the trader's first name. No record of his surname has been found. The land was not allotted during the allotment program of 1908-10. Ralph Tucker built a store within five miles of the site around 1915 (McNitt, 1962), suggesting that the Mariano store had closed by this date. The site was ultimately enclosed by the Sargent Ranch.

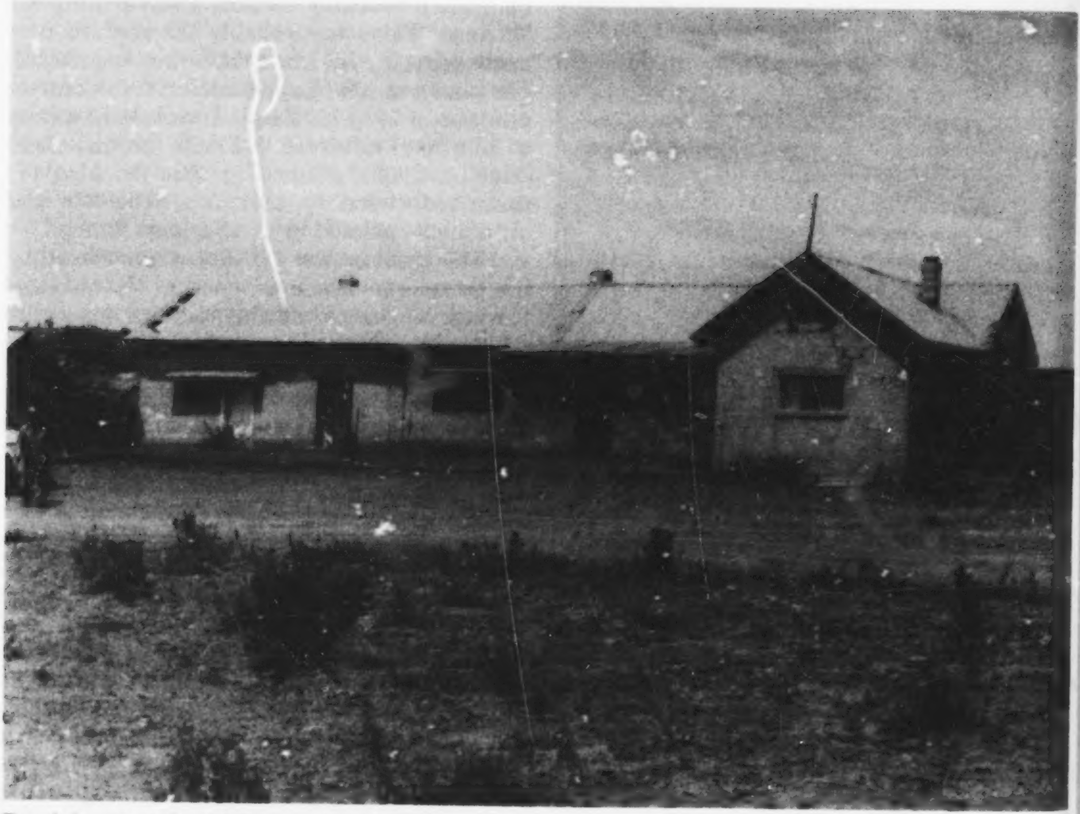
The trading post at A3 was abandoned by its proprietor when he shot a Navajo, and fearing vengeance, he fled, leaving his entire stock behind. No documentation of the event has been located. It is probable that it took place quite early or a record of it would most likely have been encountered.

Camps.

Six camps or shelters were noted at five sites which are believed to have had Spanish-American use. Five of these are against the bases of boulders or ledges, often with some slight overhang, with dimensions ranging from 8 feet in diameter to 9 feet by 13 feet. Outlines are variable, but tend to be roundish or oval. The one open site is evidenced by a tent peg, tin cans and wood cut at no great time in the past with a metal ax. It is within the catch pen of an antelope corral, a place where no Navajo would camp if he were aware of the site's history. Tin cans also appear at one other campsite. At three of the sites, there are Spanish names inscribed on the rock surfaces, dates ranging from 1911 to 1941.

Corrals and Sheep Beds.

Four sheep bed grounds and three corrals were noted that may have had Spanish-American use. The corrals, all rectangular and



Ranch house at the old Sargent Ranch headquarters.

originally of palisaded logs, are associated with the trading post at Site C6 and are relatively large, 40 feet by 25 feet to 80 feet by 185 feet. The sheep beds are all unfenced, but situated against cliffs or in rincons. One has a wire fence across the mouth of a rincon, but this seems likely to have been a Navajo improvement. Two other sites also have Navajo remains present, including hogans, an oven and Navajo rock art. Three of the four sites with sheep beds also have inscribed Spanish names with associated dates ranging from 1910 to 1955.

Ovens.

The only oven at a permanent Spanish-American site where it might be of non-Navajo origin is that at C6. A typical *horno* about 5 feet in diameter, it is too poorly preserved to allow observation of detail that might show whether it differed significantly from the Navajo ovens.

Anglo-American Sites

Anglo-American sites were more frequently identified, both because they had more substantial structures than most Spanish-American sites and because both Navajo and documented history help to distinguish them. Functional distinction of trading posts depends to a large degree on tradition and historical documentation.

Houses.

Houses and house-like structures best called sheds are the most numerous remains at Anglo-American sites, but are not particularly common. Six such structures were observed. These occurred at only two sites.

The two stone houses at Site D5 have been described above and their history discussed. Here, it will suffice merely to repeat that they are believed to have been built in the 1870's or 1880's by an Anglo-American cattleman and to have been used but a very short time before being abandoned and taken over by the Navajo family on whose land they were located.

The other site, A11, was the Sargent Ranch headquarters in Sheep Camp Canyon. Here one structure is a multiroom dwelling built of logs and cinder blocks with a gabled metal roof, different portions probably having been constructed at different times (fig. 34). It consists of a main section measuring about 87 feet by 12 feet and a wing about 15 feet by 15 feet. Additional features include doors (the front oriented at 133 degrees), windows, an enclosed front porch and three brick chimneys. The loft under the roof is supplied with windows and probably constitutes a second story. A small house, 10 feet by 12 feet, built of lumber, plastered and again with a gabled metal roof, has a door oriented at 23 degrees and lacks windows. It was undoubtedly a storage shed. Another house of shaped sandstone blocks has a wide door, oriented at 143 degrees, a plank roof and no windows. It measures 25 feet by 35 feet and also seems to have served as a storage shed. The fourth house is built of corrugated iron on a rock foundation. The two doors are oriented at 133 degrees, and there is a window, but no chimney or stove pipe. Dimensions are 25 feet by 15 feet. It also was a storage shed, being located next to the corrals, which suggests that it was used for tack and harness. No collection was made at this site, but abundant metal and glass were observed.

According to Navajo sources, the house was built about 1934 at a former homesite of *Hastiin Tseko*, a Navajo who had been moved off the land about 1931 by Sargent. Sargent sold the ranch to the Navajo Tribe in 1958.

Trading Posts.

While the identification of Anglo trading posts was dependent upon local tradition and could be confirmed to some degree through the historical documentation, there are some features that the two examples recorded share and which may be of value for inferring a trading function at other sites. The sample is so small, as well as so localized, that the data must be used with great caution until confirmed by other sites. In each case, the complex consisted of the trading post itself, a dugout or root cellar and a corral.

Site A12 is the original Kimbeto Trading Post (fig. 35). It is located on a sandy gentle southeast slope among rocky slopes and small buttes, the most prominent of which is known in Navajo as *Giní Bit'ohí*, "Goshawk's Nest," from which the English name is derived. The remains of the trading post are merely the foundation and tumbled walls of a structure built of unshaped sandstone blocks and slabs with interior dimensions of about 30 feet east-west by 24 feet north-south. A good deal of the wall material has been removed, probably for use in the construction of the more recent Kimbeto post about one-half mile to the south. A trash heap is located about 35 feet to the southeast. A wood chopping area is 22 feet to the west of the structure. Old trash includes solder-sealed tin cans, pop bottle tops, sun-purpled glass and key-opened sardine cans, as well as miscellaneous items such as horseshoes, and cartridge cases. There has been modern recreational use of the site as evidenced by a pothunter's hole, a pop-top can and relatively new wine bottles. A collection of older trash yielded outside dates from 1867 into the 1920's, with clustering toward the later part of the span from about 1892 to 1920.

Available Navajo tradition tells of the use of the post from about 1914 to 1920 by an Anglo whose name is rendered as Shorty Woody. He was preceded there by a John Irvington. Woody hired Navajo freighters to bring goods in by wagon from Farmington and Blanco. He moved his operation to the present location after being

Ruins of the first Kimbeto Trading Post, with the butte from which its name derives in the background.

robbed by two white men who were never caught. Some years later, he was robbed and kidnapped by two whites at his new location. This was estimated to have been about 1938.

Documented history confirms the Navajo traditional account, refining the dates somewhat, extends the period of occupation further into the past and introduces some additional problems. The earliest record found thus far is the inclusion of the post on a map published in the *Farmington Hustler* (1:34, p. 3) in 1901. There is no indication of how long the post had been in existence nor the identity of the owners or operators. The map is not very accurate, and while it provides a record of a post of this name on the Kimbeto Wash, it cannot be considered sure evidence that the post was in the location of A-12. In March, 1902, F.E. Johnson was clerk at the store, probably for the Hyde Exploring Expedition, for during the same month, that company sold the post to Percy Starr (*Farmington Hustler* 2:10, p. 4). Starr continued to operate the store into 1903 (Ibid. 3:3, p. 4), but early in 1905, it was being run by Sam Snyder (Shelter to CIA, 15 Feb. 1905, NA, RG 75, 1492/05). In January, 1909, the store had been left by its last owner, a man named Hensley, and Richard Wetherill claimed to own it, having bought it from Will Finn, who had acquired it from Hensley in exchange for transporting his goods when he moved out. Wetherill removed the door, windows, and other fixtures and took them to Chaco Canyon (Hardy to Shelton, January 20, 1909, NA, RG 75, CF, 121904- to 51520-10-175, Post 2, Pueblo Bonito). By 1912, the store was being operated by a man named Widdows (Stacker map, NA, RG 75, CA 534). Widdows is obviously the proper English version of the man called "Woody" in Navajo traditional accounts.

An inexplicable quirk is introduced into what would appear to be a straightforward record by Anglo-American tradition. John Arrington has asserted that he built the post about 1915 and sold or lost it in 1916 (McNitt, 1962:x; McDonald and Arrington 1970:210-11). There is a considerable gap in the known documentation following this until 1926 when a news item in the *Farmington Times-Hustler* (37:18, p. 1) suggests that S.M. Setzer was clerking in the store about the end of April. By this time, it was probably at the present location. In 1931, C. Widdows was still operating the post, however (*Farmington Times-Hustler* 42:10, p. 2 Dewey to CIA, 21 Nov. 1931, NA, RG 75, CF, 63166-1931-417 Eastern Navajo). Widdows' identity is confirmed by an account of a kidnapping by two Anglo robbers at the end of April, 1934, the story giving his name as "C. Shorty Widdows" (*Farmington Times-Hustler* 45:18, p. 1). This story correlates quite well with the Navajo version, the slight variation in date being no greater than might be expected in the memory of an event that concerned the whites rather than the Navajos themselves.

The combined archeological, traditional, and historical data suggest occupation from 1901 or before until about 1920. Arrington's claim requires further investigation. It is probable that the date given by Arrington is off and that he rebuilt what was left of the post after Wetherill had stripped it. The Navajo memory of a John Irvington is no doubt a mere linguistic twist of Arrington's name. S. M. Setzer's clerking in the store in 1926 requires explanation also. He was the brother of L. G. Setzer who had the Pueblo Alto store near Pueblo Pintado and presumably was there as an employee of Widdows.

The other post, Site C5, is a little over four miles north northeast of Pueblo Pintado. It was a rock structure built of shaped sandstone blocks, the amount of shaping being rather limited however. It is now mostly collapsed or removed. The building measured about 25 feet by 55 feet, probably including at least two rooms. Trash is widely scattered and no definite trash heap could be identified, but most is along a small arroyo which has probably washed away any concentrated deposit. Trash includes tin cans, glass, wire, crockery and aluminum. Dated collections range from about 1860 to 1957, with some tendency to cluster around the turn of the century. The one late specimen is doubtless due to post-abandonment recreational use of the site, being part of a modern whiskey bottle.

This is the old location of the Pueblo Alto Trading Post. Navajo tradition dates its operation from about 1914 to about 1940. A brief account of the killing of the trader here and the burning of the post about 1918 was also recorded. This is said to have been done by two young Navajos who were drunk at the time. The post was rebuilt in the same location.

According to McNitt (1962:331-32 n.), the store was built by Ralph Tucker around 1915.

He gives what is obviously the modern Navajo name for the nearby spring, *Tsé dáá'tóh*, "Water in the Rock" (Fransted and Werner, 1975). In 1916, the store was reportedly run by E.F. Tucker, probably an error in the initials, and the English name of the place given variously as Dripping Water and Dripping Spring (Report of S.A.M. Young, July 1916, NA, RG 75, CF, Pueblo Bonito). In 1918, while Tucker was on a trip to Albuquerque, a young man named Pat Smith, who was watching the store while Tucker was away, was killed and the store burned. Tucker rebuilt the place, but died not long after (McNitt 1962: 331-32 m; Stacker to CIA, 19 July 1918, NA, RG 75, CF, 62125-1918-175 Pueblo Bonito). Just when Tucker died is uncertain, for the post continued to be referred to as "Tucker's Store" into the 1920's (Stacker to CIA, 17 May 1921, encl., NA, RG 75, CF, 40592-1921-307.4 Part 1, Pueblo Bonito; Stacker to Judd, June 12, 1924, Judd Papers, Smithsonian Institution). Following his death, however, his widow sold the place to Edward Sargent and Bob Smith who hired Lester Setzer as manager (McNitt, 1962). Setzer was already running the store by 1926 (*Farmington Times-Hustler* 37:18, p. 1). In the 1930's, Setzer appears to have been the manager, hiring a succession of clerks including Leo Warren, Joe Warren, and Earl Sanders (*Farmington Times-Hustler*, 44:13, p. 4; Ibid. 44:49, p. 8: Ibid. 48:44, p. 1; Hearings, 1937: 17,775). Sargent and Smith are said to have sold the post about 1939 to Arthur Tanner who moved it to its present location (McNitt, 1962).

Thus, Navajo tradition and documented history are in close accord. The suggestion of earlier occupation from the dating of the trash may be evidence for a prior occupation of some sort, for the location is a highly favorable one, or may merely reflect the presence of types produced over a long period.

Hogans.

Hogans associated with Navajo occupation on the same sites as those settled by Anglos were recorded at A11, the Sargent Ranch headquarters, and at C5, the old Pueblo Alto store. In the latter case, the hogan has been described above and was occupied contemporaneously but independently by the Navajos at the site. In the former, the situation is a little more complex.

A rather large stone hogan, 25 feet in diameter, was originally built by *Hastiin Tsékooh* when he occupied the site. It is oriented at 93 degrees, has a small window on the south, and a plank door. Sargent retained the building and is said to have roofed it with the present roof made of lumber, but the nature of the original roof is not recorded. It was used by Sargent as housing for Navajos he employed in his ranch operations.

Camps.

Two sites which may be of Anglo-American origin consist only of scattered trash, rock art, and in one case, a cairn. These are probably merely camp sites, although something more substantial no longer apparent on the surface may once have existed.

At Site G1, trash includes an "early" tin can, a baking powder can, an enameled metal wash basin, other tin cans and metal and sawed planks. One Anglo-American inscription, dated 1976, is obviously more recent than the trash and cannot be considered good evidence of the ethnic identity of the occupants.

The other site, G3, has even more abundant trash. Located at the base of the cliff between Pueblo Bonito and Kin Kletso, it is a likely place for campers to have stayed. The variety of trash suggests that perhaps this was the site of a temporary trading operation. Materials include tin cans, part of a large scales such as might be used to weigh wool, an enameled metal bucket, galvanized buckets, and a Liggett and Myers tobacco can. Anglo inscriptions date at 1885 and 1919, while another date of 1934 lacks any identification. Pictorial rock art includes brands, horses, Indian dancers, a wagon and other motifs, styles suggesting both Anglo and Navajo work.

Chicken Coop.

One chicken coop was recorded at the Sargent Ranch. It is a small frame structure, 17 feet by 18 feet, with the entry oriented at 83 degrees.

Corrals.

Four corrals were recorded. Two are at the Sargent Ranch, one built of ax-cut juniper and cottonwood, the other of sawed poles of the same species. The former is rectangular and has dimensions of about 180 feet by 150 feet with the entry oriented to the southeast. The latter is circular, 50 feet in diameter and oriented a little west of south. Each of the trading post sites had a corral. At Kimbeto, it was so poorly preserved that no details were evident. The other had a palisade fence of which a few stubs remain. It is rectangular and measures about 55 feet by 40 feet.

Barn.

Only one barn was noted, again at the Sargent Ranch. It is a large stone building, the rear excavated into a slope. It measures 70 feet by 27 feet with a 20-feet wide entry facing south southeast.

Root Cellars or Dugouts.

Dugout construction of the type exhibited by the barn occurred at both trading post sites. In both cases, these appear to have been storage structures and perhaps functioned somewhat as root cellars; but since they were excavated into slopes, they would have lacked the insulating properties of a true root cellar. That at A12 measured 30 feet by 16 feet, had stone walls and was oriented southeasterly. That at C5 was of nearly the same size, 28 feet by 15 feet, also with stone walls and oriented nearly south. Trash at both included sherds of glass, and in one case, crockery as well. A metal lockplate was collected at A12, but could not be dated.

Coal Mine.

Site D6 is a coal mine of the type popularly called a "wagon mine" locally. It is attributed to the Wetherills (Osborn, 1939), but it is not unlikely that others, both Anglos and Navajos, have exploited this deposit at various times.

Roads.

A wagon road leading to the mine at D6 is so badly weathered now as to be impassable for vehicles. A road ascending Chacra Mesa and passing beside Site B6 may be of either Navajo or Anglo origin.

Trail.

A well-built section of horse trail in a branch of Mockingbird Canyon has such features as a rock retaining wall with fill behind it and a cut in bedrock. It is almost certainly a portion of the boundary trail built by the Civilian Conservation Corps in the 1940's and was recorded at Site H.

Cairn.

The cairn at G1 is unique in that it is piled around the base of an ax-cut juniper post. It was possibly erected as a surveyor's station of some sort.

Cemetery.

The only formal cemetery recorded is that known as the Wetherill Cemetery near Pueblo Bonito, here designated as Site G6. It is classified as Anglo because of this traditional origin and because its use seems to have been always under Anglo supervision or control. However, the graves include Navajo and Spanish-American burials as well as Anglo. It measures about 55 feet by 80 feet. The graves are laid out in rows, although most are unmarked. The present wire fence is one installed by the Park Service. Whether it was fenced at an earlier date is uncertain, nor is the date of the cemetery's formation at all certain. There are two distinct rows of graves outlined in rocks or covered by rocks in the east half of the cemetery. In the west half, there are areas of disturbed soil, but the only identifiable grave is one with a marker, but lacking indications that the earth has been excavated.

There are five marked burials. The earliest, carved on a sandstone slab, reads:

RICHARD WETHERILL
DIED
JUNE 22
1910

A bronze plaque cemented to the slab repeats the Richard Wetherill marking and adds his wife also:

WETHERILL
RICHARD MARIETTA
1858-1910 1876-1954

Next in temporal sequence is a sandstone slab marker with a well-smoothed face:

GRACE ETCITTY
DIED July, 1923

The latest identification is on an aluminum strip around a metal plate, not all of which can be read:

------HES OF DORA,VIRGINIA
QUIET BURRIED
9-15-66

One last headstone, broken into four pieces and with the lower lines so weathered as to be illegible, lacks any date. It reads:

EN MEMORIA DE
MANUEL ARAGON

Documented burials from the historical record indicate that most burials here have been of

Navajos (Brugge, 1979), but a few markers clearly show that use has been multi-ethnic. The cemetery is the only remaining trace of the Wetherill settlement of Putman, which for a short time was a small community beside the ruins of Pueblo Bonito. Its size, in terms of structures, may be ascertained from early maps, but its population is not known.

Miscellaneous Sites.

Some sites cannot be identified either as to ethnic origin or date, but probably had use within the historic period.

At Site G, a rockshelter, measuring 92 feet by 24 feet, opens to the southeast. A hearth and manure on its floor show occupation, but there is nothing to define the use beyond this.

At B2, a small stone-lined hearth is all that was found. Associated with a spring at F7 is rock art that may include historic as well as prehistoric figures. G5 has rock art only, but again of such a character as to be undatable, the same being true of L3.

Inscriptions

A large number of inscriptions, mostly by whites, was recorded by the intensive survey, and the number was augmented somewhat during the extensive survey (fig. 36). Ethnic classification is not always certain, but by placing each name according to the most probable ethnic origin, there are 130 Spanish-American, 63 Anglo-American, seven Navajo, and two Tewa names (see Appendix B). Seasonality of presence indicated by the inscriptions is significantly different between the Spanish and Anglo names:

	Mar - Oct
Spanish-American	6 (9 percent)
Anglo-American	10 (56 percent)
	Nov - Apr
Spanish-American	61 (91 percent)
	18 (64 percent)

Even without the contrast provided by the Anglo sample, dated Spanish-American inscriptions clearly cluster during the winter months. In addition, most of the Spanish-American inscriptions that give the town from which the writer came list 37 towns in the Chama River drainage, as opposed to five from other places. It is thus quite safe to conclude that most of the Spanish-American visitors were tending sheep brought from the Chama to winter range in the Chaco region. Since the Anglo-American inscriptions show a tendency to be in the winter months as well, it is probable that at least some of these also reflect activities associated with the sheep business. At least one of the Tewa visitors, both of whom were from Nambe, was also present in the winter and may well have been working as a sheepherder.

It is of interest that few of the Anglo inscriptions note a town, while a great many of the Spanish inscriptions do so. In part, this may be merely a matter of the time the writer had to invest in his inscription. Fifty-one percent of the Spanish inscriptions have dates, but only forty-four of the Anglo are dated. The difference is more striking with regard to towns. Spanish inscriptions give a place name 33 percent of the time and the Anglo 16 percent. One very prolific inscriber, Preciliano Martinez, accounts for nearly a quarter of these entries, however, and other repetitive inscriptions also produce some duplication. While each date is in itself significant regardless of whether by an individual who produced other dates, the importance of the inclusion of hometown or town of residence as opposed to omitting this information would be of significance only as a measure of cultural or psychological difference between different ethnic groups. At least one of the Spanish-Americans, Silviano Archuleta, affiliated with his town of current residence, giving Canjilon at one time, and at another El Rito. Having no data regarding the degree of mobility of Spanish-American sheepmen, the lack of changes in the other sets of inscriptions cannot be evaluated with any degree of certainty, but it seems likely that most were men who maintained their homes in one town throughout their lives. The higher degree of use of a town name in their inscriptions may, therefore, indicate a stronger identification with their town than was true among the Anglo-Americans who, as a group, were probably more mobile with regard to place of residence.

The scarcity of Navajo names is a reflection of two fairly obvious factors: the recency of literacy among them and the fact that they were in their home territory and would therefore have felt a far less reason to record their presence in this way. The virtual absence of inscriptions by visiting Indians is noteworthy also.

Spanish-American inscription at Site 1.

None of the Zuni workers hired by Judd nor the Sioux Civilian Conservation Corps workers have been identified among the names.

Collections

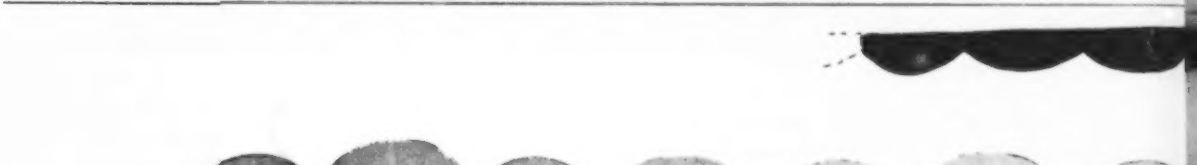
Indian Pottery.

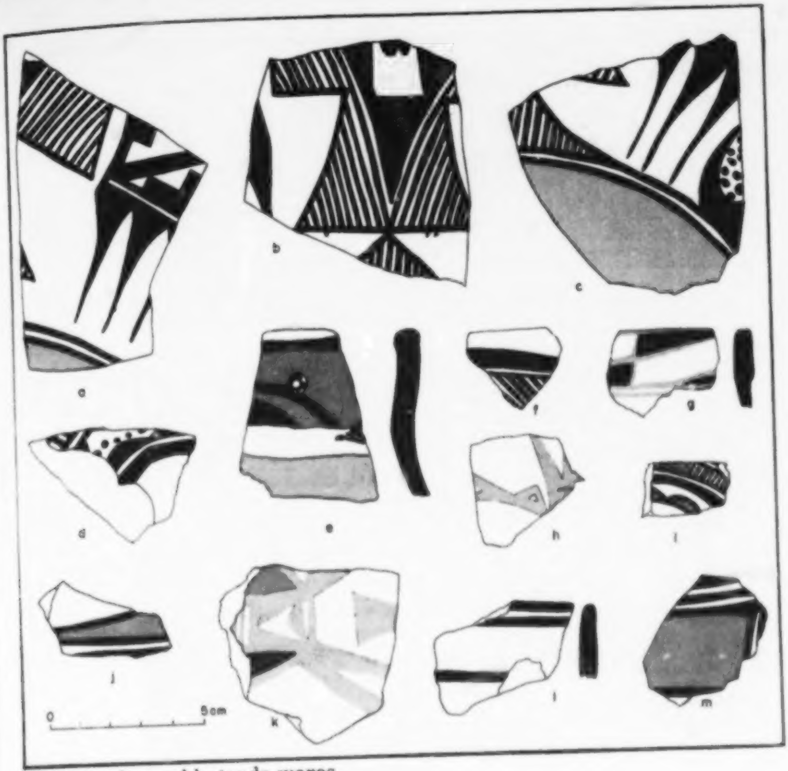
Indian ceramics were found only at sites classified as Navajo. Use of local pottery may not have been limited to Indians, but no archeological data exist to show use by whites. It must be presumed that any utilization of Indian pottery by non-Navajos was very limited and restricted perhaps to decorative purposes. Detailed distribution is given in Table 1.

The earlier Navajo sites produced proportionately more of the pottery than did the later. The decrease in ceramic collections through time is unevenly progressive:

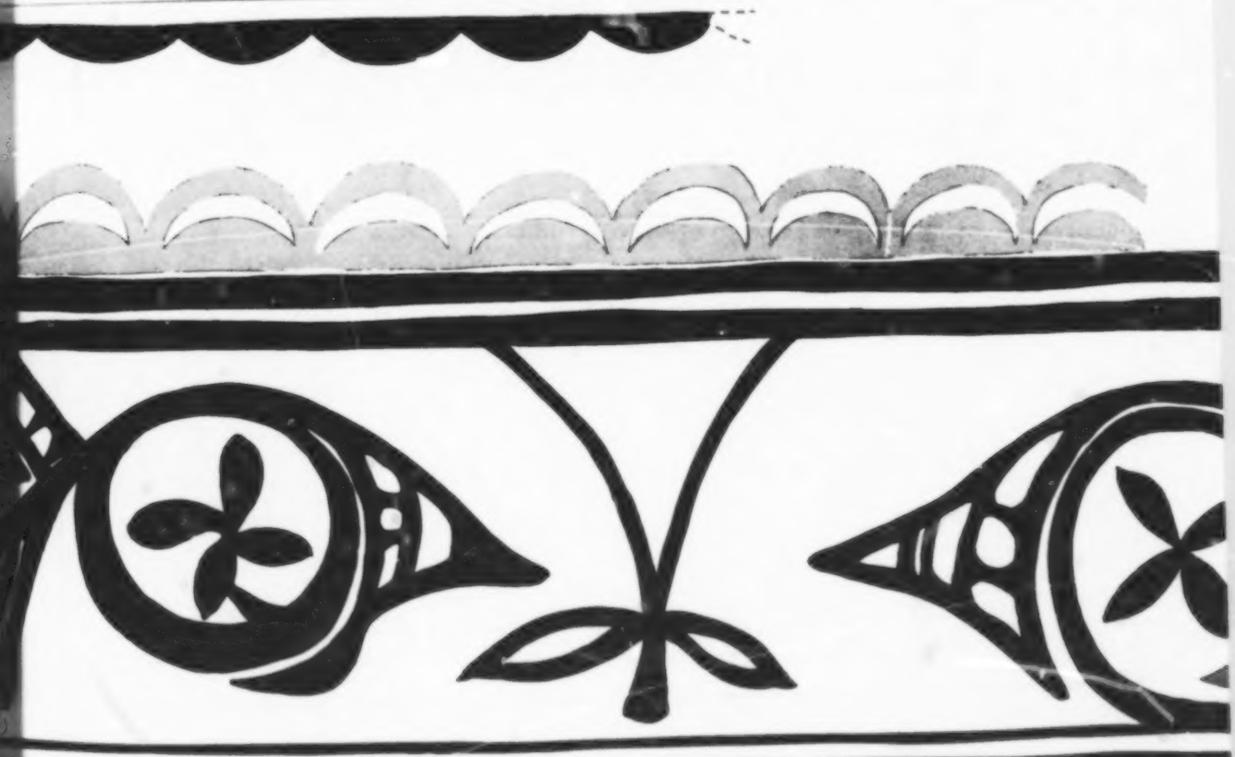
	Number of Sites	Number with Pottery	Percent with Pottery	Number of lots (Proveniences)	Average number of Sherds per site
18th century	20	18	90	59	64
1800-1868	10	3	33	4	9
1868-WWI	15	8	53	17	14
1880-WWII	8	-	-	-	-
WWI-WWII	30	5	17	5	0.5
Post WWII	4	-	-	-	-

Site P, Laguna Acoma pottery design.




a
b
c
d
e
f
g
h
i
j
k
l
m
0
5 cm

Body sherds, pueblo trade wares.



KEY
R = Red Rim
r = Red Base
B = Black Rim
b = Black Base
X = Present
● = Complete or restorable vessel, counted as one shard

	NAVAJO POTTERY							TEWA SERIES			PUNAME SERIES						SANTA ANA SERIES			ACOMA SERIES							ASHIWI SERIES				HOPI				MISC						
	Dinetah Utility	D.U. Micaceous Var	D.U. Transitional Var	Navajo Utility	N.U. Micaceous Var	Gobernador Poly	Navajo Painted	Tewa Polychrome	Type Unknown	Ogapogeo Poly	NE Keres	Puname Poly	San Pablo Poly	Trios Polychrome	Zia Polychrome	Type Unknown	Ranchitos Poly	Santa Ana Poly	Type Unknown	Type Unknown	Red Rim	Ako Polychrome	Acomita Polychrome	McCartys Polychrome	Acoma Polychrome	Laguna Polychrome	Kiapkwa Polychrome	Type Unk., Red Rim	Type Unk., Black Rim	Type Unknown	Black on Yellow	Late Polychrome	Type Unknown	Jeddito Yellow Ware	Polished Black Ware	Micaceous Utility Ware Type Unknown	Nambe Utility	Zia Utility	Cimarron Micaceous	Unknown	TOTALS
18th CENTURY																																									
A9													1																												1
B1 Pueblito 3	11		1				1																																		13
House 7	6		14																																						20
Hogan 8	5		4																																						9
Hogan 10																											5														5
Check Dam 11	1																																								1
Previous Collections	104	14	1*			9	2		2	1									1	9	1							1	4	10	4	1		1							201
B3 Hogan 1	8																1						1																		8
SJ1641	12		4*				3		1									1																							21
SJ1648	35		11																																						48
B6 Hogan 1	2																					13								1											16
Sheep Bed 2	3																					2								2											7
Hogan 3 Ash Heap	10																					5																			16
Top of Wall	2																					8																			10
Lamb Pen 4	16						4															2						5													28
B7 Hogan 1 30' North	4									1																															5
Ash Heap	7		3																			2																			12
Hogan 2	16																																								16
Hogan 3	2	2																																							4
Sherd Area 4		20																																							20
Hogan 5 Ash Heap	1																																								1
Ramada 6	1		1																																						2
B10 Hogan 4 Interior				1																																					1
Exterior	2			1																																					3
Hogan 5	1		1																																						2
E1 Hogan 2 Ash Heap			3																											1											4
Talus	5																																								5
Previous Collections	30		6*			9	7									4			1											6											x64
E5 Hogan 1 Exterior	15																																								15
Ash Heap	9	4																																							△13
Interior	17																																								17
E6 Hogan 1	1																																								1
Hogan 3 Ash Heap	8																																								8
Windbreak 4 Ash Heap																											●														1

* Includes 3 vessels of Dinetah Utility, Transitional variety

△ Temper of Micaceous variety probably from San Mateo Mt area

KEY
R Red Rim
r Red Base
B Black Rim
b Black Base
X Present
● Complete or restorable vessel, counted as one shard

	NAVAJO POTTERY							TEWA SERIES			PUNAME SERIES						SANTA ANA SERIES			ACOMA SERIES							ASHIWI SERIES				HOPI				MISC						
	Dinetah Utility	D.U. Micaceous Var	D.U. Transitional Var	Navajo Utility	N.U. Micaceous Var	Gobernador Poly	Navajo Painted	Tewa Polychrome	Type Unknown	Ogapogeo Poly	NE Keres	Puname Poly	San Pablo Poly	Trios Polychrome	Zia Polychrome	Type Unknown	Ranchitos Poly	Santa Ana Poly	Type Unknown	Type Unknown	Red Rim	Ako Polychrome	Acomita Polychrome	McCartys Polychrome	Acoma Polychrome	Laguna Polychrome	Kiapkwa Polychrome	Type Unk., Red Rim	Type Unk., Black Rim	Type Unknown	Black on Yellow	Late Polychrome	Type Unknown	Jeddito Yellow Ware	Polished Black Ware	Micaceous Utility Ware Type Unknown	Nambe Utility	Zia Utility	Cimarron Micaceous	Unknown	TOTALS
E7 Hogan 1 General	1																																								1
Ash Heap	8		10										11																												29
Hogan 2 Ash Heap			10																																						10
Hogan 4																1																									1
Hogan 5	6																													1											7
Hogan 6 Ash Heap			1																																						1
½ N.E.													1																												1
E9 Pueblito 1	9																																								9
Rock Shelter 3	5																																								5
Hogan 4 Ash Heap	8																													5											13
½ East	3																																								3
Sherd Area 5	2																													2											4
Previous Collections	24						1		2							18													4	1			1								52
K1 Previous Collections	14					2	1									2														1											20
K4 Rock Shelter 1	2																																								2
K5 Pueblito 1 Ash Heap	20	10																												4										1	35
Ash Area	56	8														1																									65
½ West	33	44																																							77
Previous Collections	29					15	3									6R				2									1	7			22		1						103
K6 Pueblito 1	16	7					1									1																									27
Trail 3				1																																					1
Previous Collections	4					10																							2	4											20
K8 Hogan 1																																									—
Ring 2	2																																								2
Previous Collections	40						2																							42											84
K9 Hogan 1 ½ East	1	2					3																																		6
Hogan 2 Under Rock																																				2					x2
Cache 3		2																																							2
House 5 Near Entry	1																																								1
Hogan 8	12																																								12
Previous Collections		2	17	20																			8R	1			13			2										1	64
L1 Rock Shelter 1	1																																								1
General Surface				3																																					3

* Tewa or Isleta

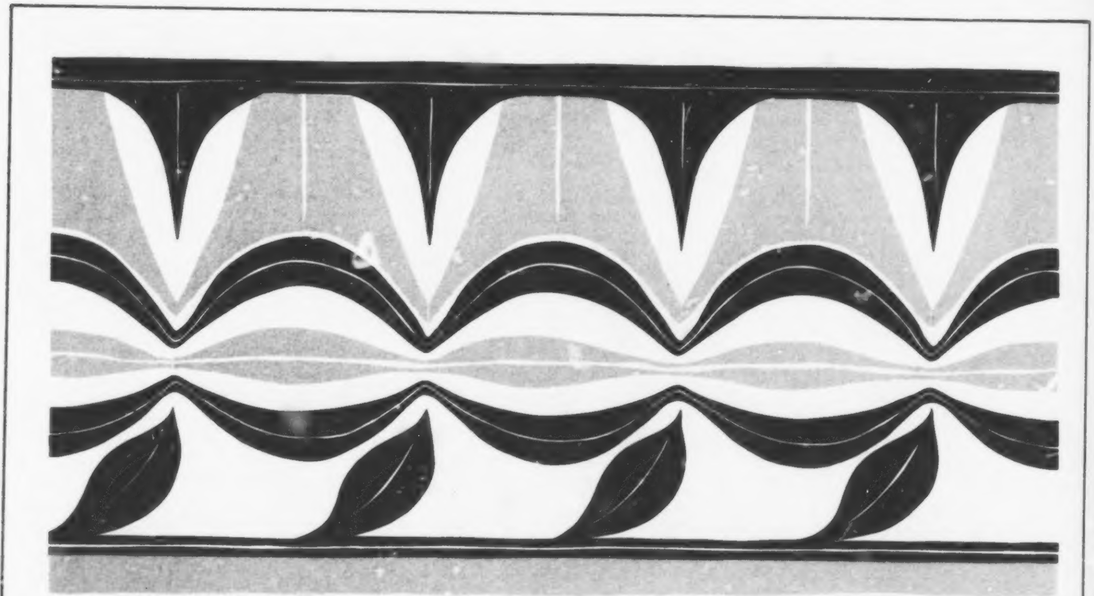
KEY
R = Red Rim
r = Red Base
B = Black Rim
b = Black Base
X = Present
● = Complete or restorable vessel, counted as one shard

	NAVAJO POTTERY							TEWA SERIES			PUNAME SERIES						SANTA ANA SERIES			ACOMA SERIES							ASHIWI SERIES				HOPI				MISC						
	Dinetah Utility	D.U. Micaceous Var.	D.U. Transitional Var.	Navajo Utility	N.U. Micaceous Var.	Gobernador Poly	Navajo Painted	Tewa Polychrome	Type Unknown	Ogapoge Poly	NE Keres	Puname Poly	San Pablo Poly	Trios Polychrome	Zia Polychrome	Type Unknown	Ranchitos Poly	Santa Ana Poly	Type Unknown	Type Unknown	Red Rim	Ako Polychrome	Acomita Polychrome	McCartys Polychrome	Acoma Polychrome	Laguna Polychrome	Kiapkwa Polychrome	Type Unk., Red Rim	Type Unk., Black Rim	Type Unknown	Black-on-Yellow	Late Polychrome	Type Unknown	Jeddito Yellow Ware	Polished Black Ware	Micaceous Utility Ware Type Unknown	Nambe Utility	Zia Utility	Cimarron Micaceous	Unknown	TOTALS
1800 - 1868																																									—
E2 Hogan 1																			1																						1
E8 Shard Area 1				64																																					64
Shard Area 2				8																																					8
E7 Hogan 1			X																																						X
Previous Collections				9																																					9
1868 - WW I																																									—
E Cache 1														6●												6●															15
E7 Hogan 3																																					5				5
E4 Hogan 1															1																							1			2
E5 House 1				28																																					28
D4 Previous Collections				4																																					4
E2 Hogan 1 to East				2																																					2
Hogan 2 to Northeast				1																																					1
Hogan 3 Ash Heap				1																																					1
E7 Hogan 2		1																																							1
Hogan 5 Ash Heap	1																																								1
Shard Area				13																																					13
Door Entry				1																																					1
Hogan 7 Ash Heap				3	1																																				4
Hogan 8				2																																					2
Previous Collections				57	20																								24												101
E8 Hogan 1				1																																					1
Hogan 2				1																																					2
House 4 Ash Heap																																									5
Previous Collections	2		8								5																													2	12
WW I - WW II																																									—
Hogan 7																3																									3
Hogan 3																									1																9
E9 Previous Collections																										1															1
E10 Ash Heap A																														1											1
Previous Collections																																							2		6
D0 Previous Collections				1					2																																3
TOTALS	677	4	87	236	21	44	26	[illegible]	1	2	5	[illegible]	3	4	4	66	[illegible]	[illegible]	1	[illegible]	[illegible]	33	5	[illegible]	1	2	33	4	47	85	6	[illegible]	21	[illegible]	[illegible]	2	5	[illegible]	2	4	1578

* Includes 4 restorable vessels

The decline in ceramics is most apparent between the sites of the 18th century and those of later periods. It would undoubtedly be less dramatic had it been possible to separate the early to mid-18th century sites from those of the latter part of the century with greater confidence. The very limited number of tree-ring dates available from Navajo sites in this region gives sufficient cause to exercise restraint. A few sites do seem definitely early, in particular those with pueblitos in the Pueblo Pintado section. Not only is their architecture typologically early, but they lack the Transitional Variety of Dinetah Utility and have only the red rims of pre-1765 on sherds of the Puname Series. Ashiwi Series rim sherds, however, have only black rims. These appear to be from Zuni rather than Acoma, suggesting that Harlow's (1973) dating of the beginning of black rims at Zuni around 1800 is too late. Since black-rimmed sherds of Ashiwi Polychrome appear at all three of the Pintado section pueblito sites, and since these are associated with Puname Series sherds with red rims, a beginning date of no later than 1740 for this feature at Zuni seems reasonable. Continued use of red rims with a period of overlap or contemporaneity may be postulated as well (figs. 37 and 38).

In any case, the reduction in ceramic collections from sites post-dating 1800 is quite evident. This may be due to two causes, a lesser use of pottery by the later Navajos, and a different manner of disposing of broken vessels. Both factors were probably involved. As Puebloan architecture was modified, so were other Puebloan customs which had been introduced by refugee groups. The disposal of major artifacts was no longer a function of the trash heap, which became in effect a mere ash heap. Broken pottery and weaving tools were taken to some sheltered spot, under a bush or ledge, at some distance from the dwelling for disposition, and medicine bundles of no further use were deposited in special places of a sacred character. Other items, such as baskets, agricultural tools, weapons and hide working implements, probably received similar treatment. This custom seems to have been used in the latter part of the 1700's. It is an important factor in the sparsity of ceramic materials in the archeological remains at Navajo habitation sites. The more mobile way of life that developed as the pastoral portion of the economy grew in importance, however, made goods which are difficult to transport, such as pottery, less desirable as well. Indeed, any late



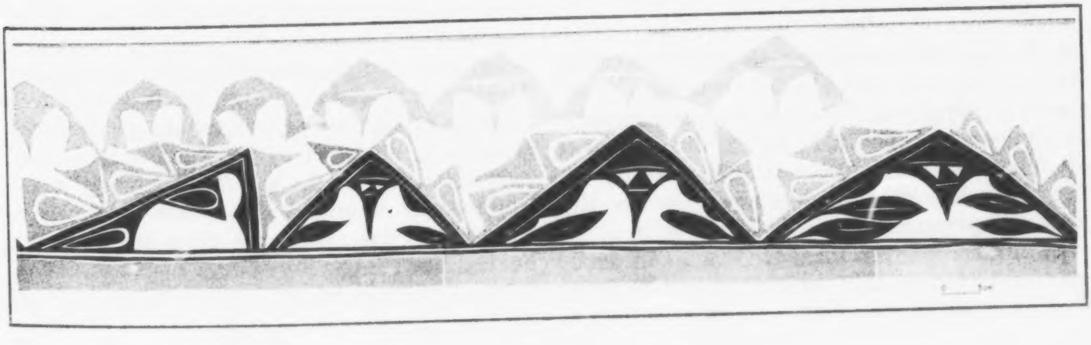
Site P Trios Polychrome jar designs.

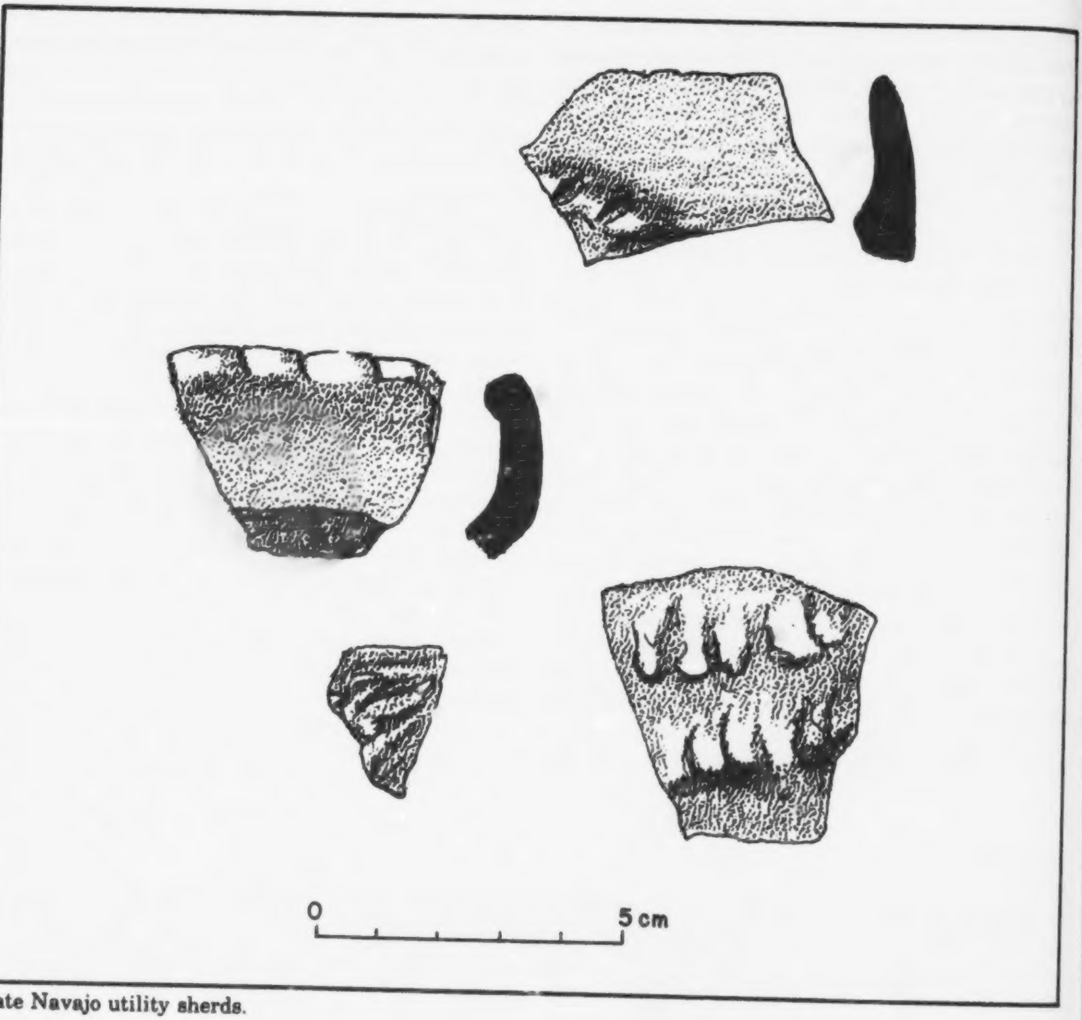
site with an abundance of native artifacts is quite likely to be one abandoned under unusual circumstances, such as death in a hogan. Late Navajo Utility sherds were uncommon and usually rather small (fig. 39).

Painted pottery of Navajo manufacture is completely absent in the sites postdating 1800, undoubtedly a result of cultural prohibitions (Brugge, 1963). Trade pottery is predominantly decorated ware, however, and its use extends at least into the period between the two world wars. Traded undecorated pottery is limited to two sherds of Cimarron Micaceous, five of Nambe Utility, and 11 of Zia Utility, each type being from one site only. In addition, two sherds of an unidentified micaceous ware and one of a polished black ware are probably exotic types. It is worth noting in connection with the Nambe pottery that the only Tewa town represented in the inscriptions of names is Nambe, Ramon Montoya being in the Chaco area in 1932, and a Garcia probably in 1940 (see Appendix B).

Trade types indicate trade patterns for pottery, of course, but several neighboring tribes and pueblos with whom the Navajos undoubtedly traded did not make pottery or made no decorated wares. Still, it is possible to get some idea of trade patterns through time from the imported types. In general, these patterns were remarkably stable. Zuni was the major source of foreign pottery from the 18th century through the end of World War I and was still exporting some pieces into the period between the wars. Judd's hiring of Zuni workers for his excavations in the 1920's may have helped stimulate continuing trade with that pueblo. The central Keres (Zia and Santa Ana) are represented in the four periods for which collections exit and were apparently important as long as Pueblo pottery was purchased. Zia was the preferred trade center of the two pueblos. The western Keres (Acoma and Laguna) form another pair of towns from which pottery was regularly acquired, Acoma in this case being the favorite. Hopi, the northeastern Keres, and the Jicarillas were lesser sources, each being represented in only one time period. Imports from the Tewa pueblos were somewhat more constant, but always in a limited quantity. A cache of broken vessels collected by Vivian from Site P is of interest in providing good examples of restorable vessels of turn-of-the-century wares made at Zia and Laguna or Acoma (fig. 40-42). Distributions of imported Indian ceramics through time, in numbers of sherds and, in parenthesis, average number of sherds per site, are as follows:

	18th Century	1800-1868	1868-WWI	WWI-WWII
Jicarilla	---------	---------	---------	2(0.07)
Tewa	7(0.35)	---------	5(0.33)	2(0.07)
NE Keres	---------	---------	3(0.20)	---------
Zia-Santa Ana	44(2.20)	1(0.10)	16(1.07)	4(0.13)
Acoma-Laguna	45(2.25)	1(0.10)	1(0.20)	3(0.10)
Zuni	159(7.45)	2(0.20)	26(1.74)	1(0.03)
Hopi	29(1.45)	---------	---------	---------





Late Navajo utility sherds.

Euro-American Trade.

No trade items from Euro-American sources can be identified positively as predating 1868. Once peace was established, however, trade seems to have flourished and grown rapidly in importance. Table 2 shows the temporal distribution of trade objects that were dated. Superimposed on the object periods are the known or presumed periods of occupation of the sites as derived from oral tradition and documentary sources. The oral tradition is from Navajo, Spanish-American, and Anglo-American sources. Most of the Navajo and Spanish-American traditional data were collected in the course of this project, while most of the Anglo-American tradition is from published sources. The documentary data are largely from archival sources, but there has also been considerable reliance on published historical accounts, in particular for Anglo-American trading posts. The weakest data are with regard to Spanish-American sites, only one Spanish-American having been interviewed and his information relating only in general terms to the specific sites in this survey.

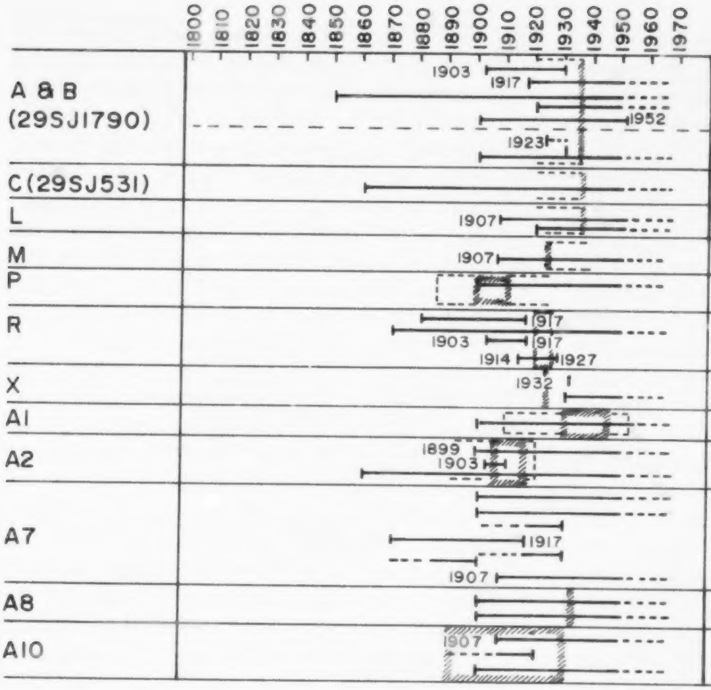
All kinds of data were taken at face value insofar as explicit statements are concerned unless there were conflicts between or among sources. The discussions of dating given above under the descriptions of site features present the specific reasoning where conflicting data had to be resolved or inferences made. It is felt that when relatively precise dates were obtained that these are generally minimal dates. This is particularly true for Navajo oral tradition, where informants usually restrict their statements to what they know of their own personal knowledge, or can quote fairly closely from a known source, usually a direct ancestor, and documented dates, which often merely identify a point in time when there were occupants on the site. Both sources do sometimes present more general information on periods of occupancy. Published sources are more likely to present general dates or estimated dates based on the authors' inferences without being explicit as to the assumptions on which they are based. While such dates are often quite accurate, care must be exercised to recognize them as secondary data, not as documented history, when documentation contemporary to the events described is not cited.

While Navajo oral tradition has frequently been disparaged in historical studies, it has been found here to be equal, if not superior, to that obtained from whites. No tradition of "tall-tale telling" of the sort that grew up among frontier whites exists in Navajo culture, and informants who accepted the research as being a serious and legitimate endeavor gave careful replies to questions, qualifying their information as to source and accuracy and identifying their own conclusions as such.

It is felt that when they were in error, they were still trying to convey data as they believed it to be true. There was no indication that they tried to enhance the prestige of either themselves or their ancestors in their accounts through making exaggerated claims to their accomplishments or through withholding potentially derogatory material. On the contrary, they were often so disarmingly frank that the conscientious enthnohistorian finds it necessary to exercise judgment of his own with regard to community scandals and gossip that is not routinely available regarding whites if he is to treat all ethnic groups equally. Most Navajo informants were not fully literate and consequently had little conception of the consequences inherent in publication of the data they imparted. If data were withheld, these were most probably with relation to religious knowledge which was felt to be improper for transmission to whites. Except for events of the remote past, it was seldom necessary to make very far reaching inferences, and the chief obstacle to accuracy was that involved in interpreting their statements into English as precise as their Navajo. Information was obtained from field interpreting rather than recorded on tape for careful translation at a later date. While the latter method is preferable, it was not feasible for this project. Despite this problem, the Navao tradition was found to correlate very well with the contemporary documentation for the sites.

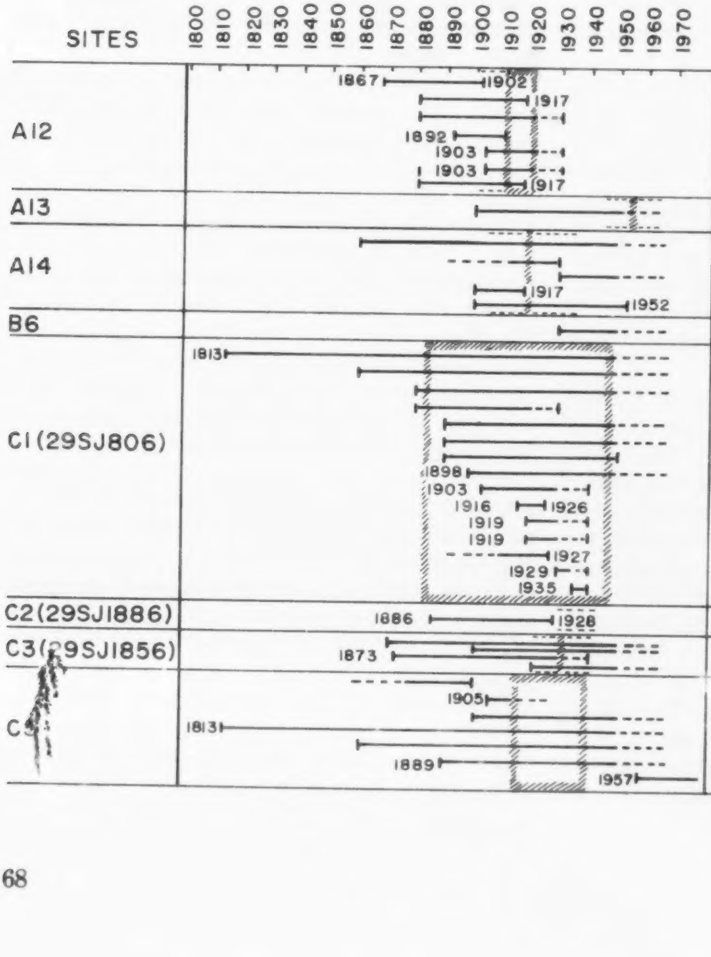
The limitations of dating a site on the basis of objects recovered from the surface are apparent from a comparison of the data in Table 2. Larger numbers of specimens that can be dated, such as might result from excavations, would obviously give better control. Dates that can be considered firm are quite restrictive for many sites. Placement into broad time periods is often facilitated, however, with only a very few dates.

The time spans of most objects cross or fall within the periods indicated by historical sources for occupation of the sites. In those cases where this is not true, various explanations are possible. Most obvious is that the temporal span of occupation is greater than the historical data show. This is probably the case in some instances, but the other possibilities that exist must not be ignored. Deposition by ephemeral use of the site as by travelers, sheepherders, relic collectors, visitors for picnics or drinking undoubtedly accounts for some anachronistically late dates, most being beverage containers that might be expected to result from such circumstances. One such site, C5, is quite close to a spring that is still used, and visits by water haulers provide the most probable reason for deposition of late materials. There is also good evidence that abandoned Navajo homesites were sometimes used as sheep camps by Spanish-American herders. While some use was of extremely short duration, a few days at most, it was often repetitive, the herders returing to a good camp site year after year. Some of the more diagnostic specimens are illustrated in Figures 43 through 49.



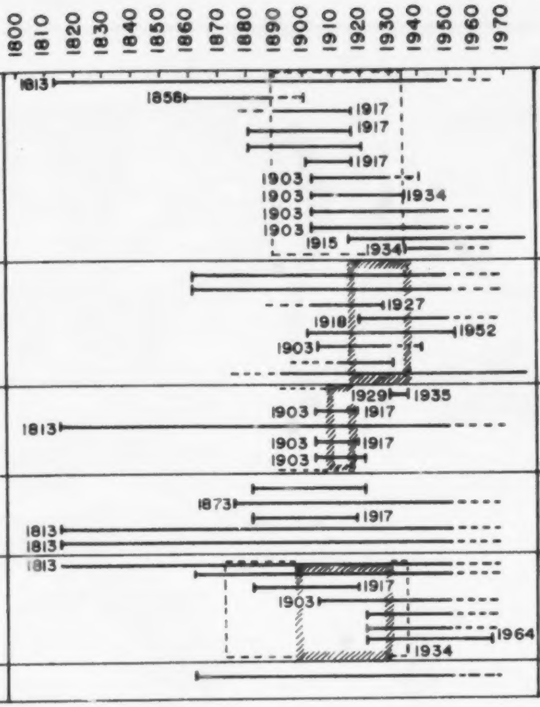
	COMMENTS
A & B (29SJ1790)	A & B are parts of one extended family occupation. Historical - Up to 1937. Trade - Extends occupation back to perhaps 1923.
C(29SJ531)	Historical - Up to about 1936-37.
L	Historical - Up to about 1936-37.
M	Historical - Beginning about 1922-23.
P	Historical - By 1899 (possibly 1885) to post - 1910.
R	Historical - ca. 1920 to 1925. Trade - Extends occupation back to ca. 1917.
X	Historical - ca. 1924. Trade - Extends occupation up to 1932.
A1	Historical - 1930 (or 1909) to 1945 (or 1952).
A2	Historical - by 1905 to 1915 (or 1919).
A7	Historical - no data. Trade - minimal dating 1900 to 1907.
A8	Historical - ca. 1932.
A10	Historical - 1890-1930.

929
82004



SITES	COMMENTS
A12	Historical - 1901 or 1914 to 1920. Trade - The longer period fits well with the trade goods and it is most likely that the post operated by the Hyde Exploring Expedition was on this site.
A13	Historical - ca. 1954.
A14	Historical - ca. 1918. Trade - extends occupation into the 1930's.
B6	
C1 (29SJ806)	Historical - ca. 1884 to 1948.
C2 (29SJ1886)	Historical - 1930's.
C3 (29SJ1856)	Historical - 1930-31.
C5	Historical - ca. 1914 to 1939. Trade - Extends beginnings back to ca. 1900. Late glass probably associated with post-abandonment use of the spring.

929
82005



SITES	COMMENTS
C6	Historical - Possibly as early as the 1880's to probably the 1930's. Trade - Minimal dating from ca. 1900 to 1934.
C9 (29SJ699)	Historical - ca. 1915 to 1936.
D3	Historical - ca. 1908 to 1915, With possibly earlier occupation. Trade - Late glass probably indicates post-abandonment use, probably recreational.
D4 (29SJ610)	Historical - no data.
D5 (29SJ609)	Historical - Possibly 1870's to 1927 or 1934. Trade - Confirms occupation to 1934, but early occupancy poorly represented in surface collections.
E2	Historical - no relevant data.

929
82006

├──┤ Known dates for trade type (date shown if not in even decades).

├- - - -┤ Probable dates for trade type.

├── - - - Ending date of trade type unknown.

- - - ──┤ Beginning date of trade type unknown.

| Trade object datable to a single year.

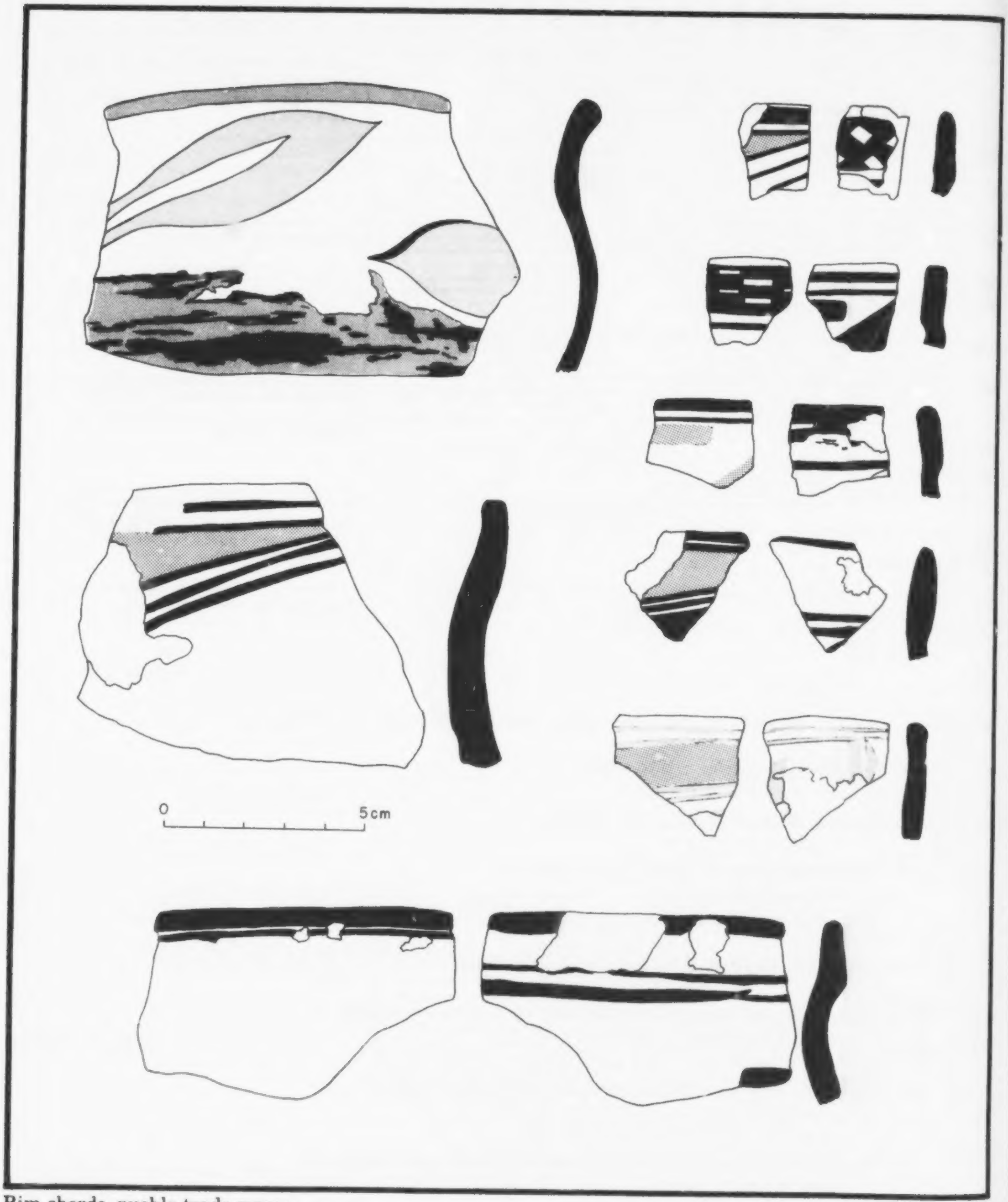
▨ Precise historical date considered reliable.

▨ Range of site occupation considered well-established in terms of precise dates.

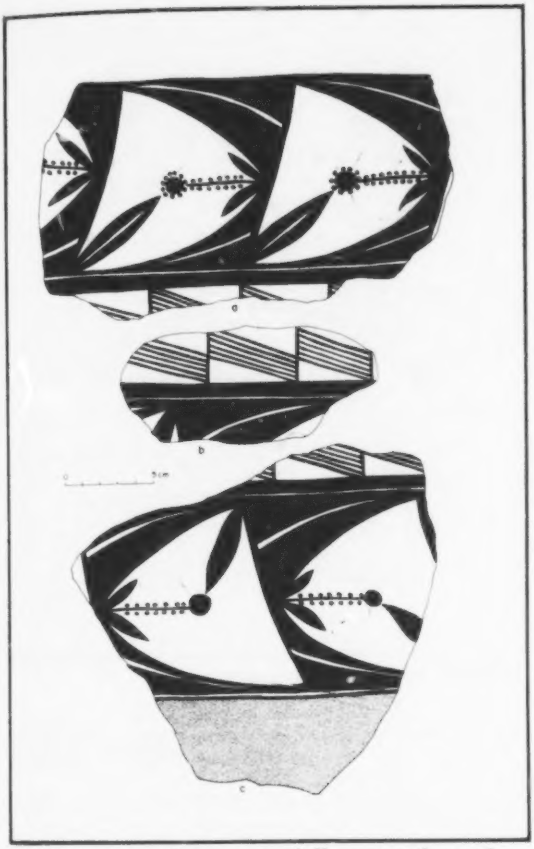
⬚ Range of site occupation considered probable in terms of precise dates.

- - - - Range of site occupation considered probable in terms of approximate dates.

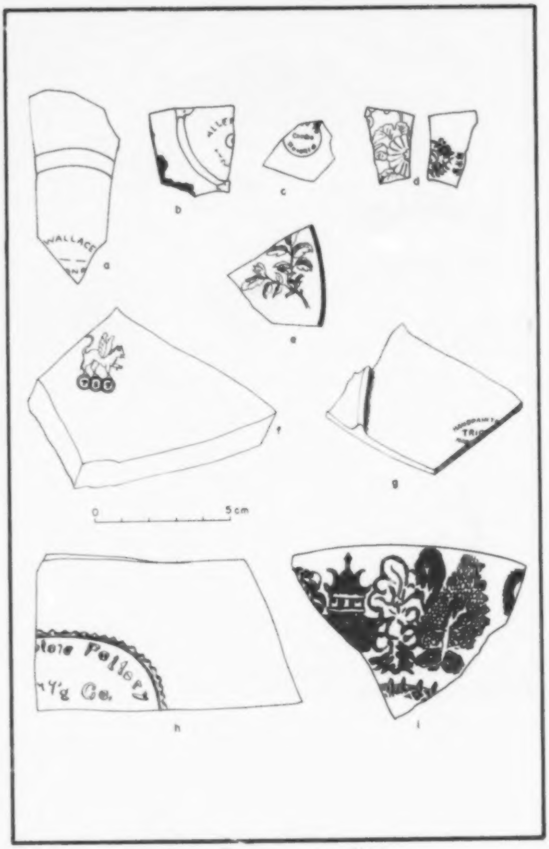
929
82003



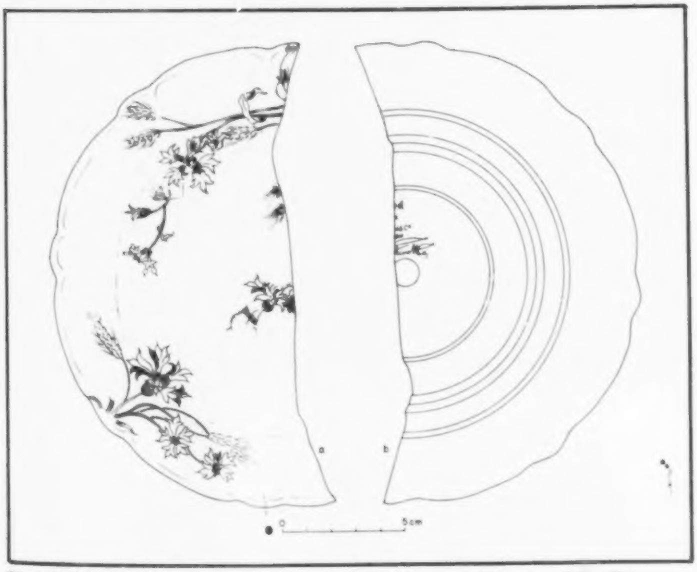
Rim sherds, pueblo trade wares.



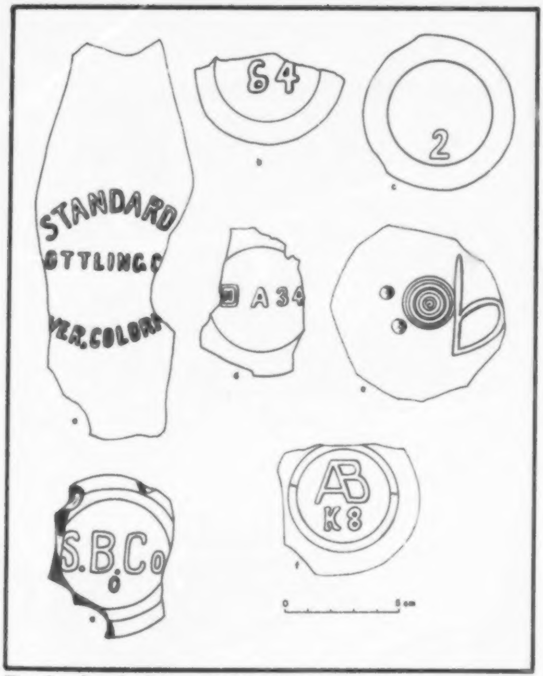
Site P Acoma or Laguna partially restored vessel.


WALLACE
a
ALLE
b
c
d
e
f
TRIO
g
0
5cm
Potter
M'f'g Co.
h
i

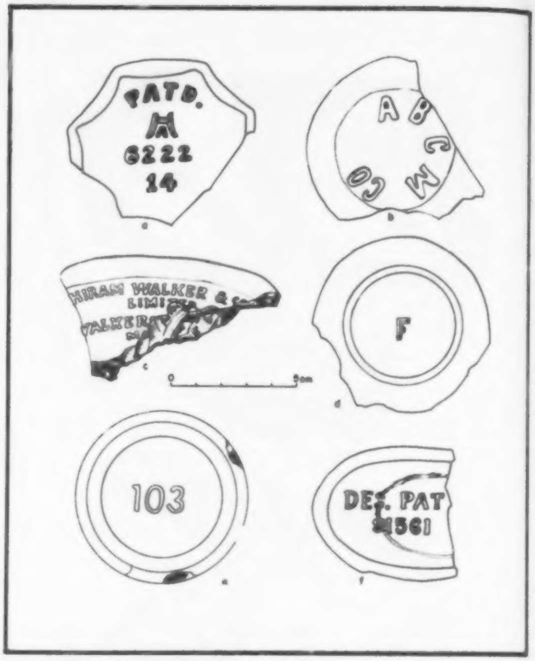
Designs on crockery from recent sites.



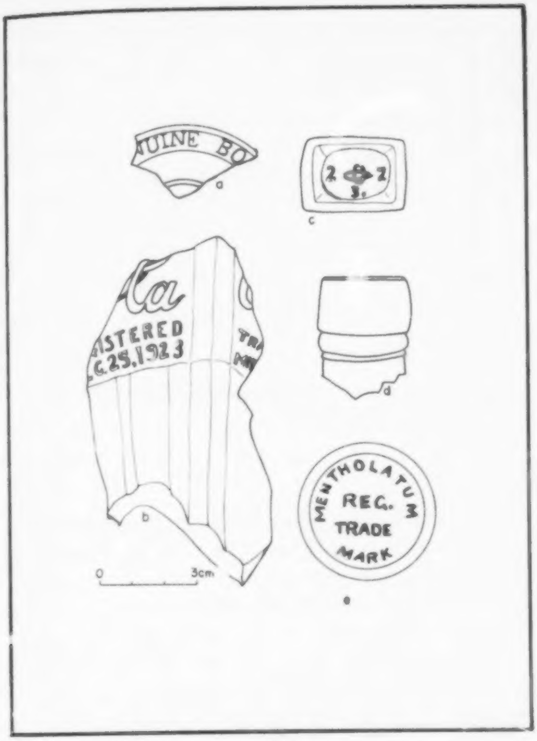
Haviland and Company plate, made in Limoge, France, Site C5.


STANDARD
OTTLING C
VER.COLORA
64
2
A34
S.B.Co
0
AB
K8
0
5 cm

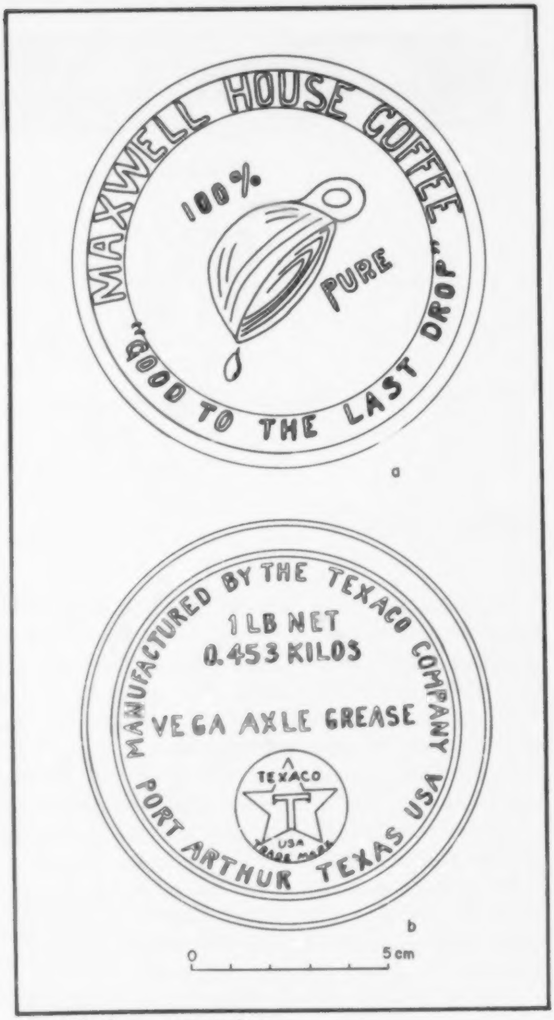
Bottle sherds from recent sites.


PATD.
6222
14
ABCMCO
HIRAM WALKER &
LIMITED
WALKERVI
F
0
5 cm
103
DE PAT
1561

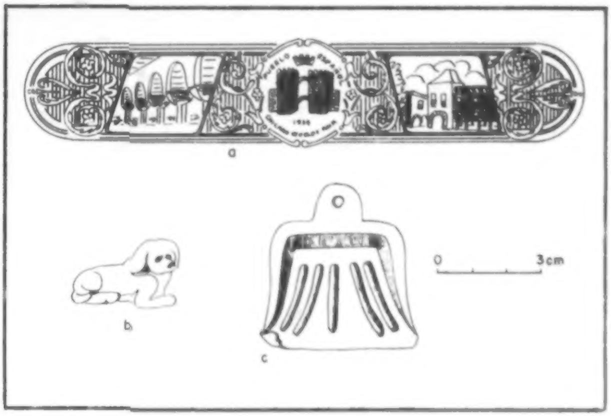
Bottle sherds from recent sites.


UINE BO
a
2 2
3
c
la
ISTERED
G.25,1923
TRA
MA
b
d
0
3cm
MENTHOLATUM
REG.
TRADE
MARK
e

Bottle sherds from recent sites.


MAXWELL HOUSE COFFEE
100%
PURE
"GOOD TO THE LAST DROP"
a
MANUFACTURED BY THE TEXACO COMPANY
1 LB NET
0.453 KILOS
VEGA AXLE GREASE
TEXACO
T
USA
TRADE MARK
PORT ARTHUR TEXAS USA
b
0
5cm

Can lids from recent sites.



Jewelry and toys from recent sites.

Native Artifacts.

Only three time periods plus one miscellaneous site produced lithic artifacts. By far, the greatest number are from 18th-century sites. Quantities decline rapidly. The early to mid-19th century sites yielded few stone tools, but in view of the few sites representing this period, the number would appear to be of some significance. Only the collections from these two early periods included flakes and chips. It would appear that there was an active lithic industry during these periods. The few later items, all from World War I to World War II, include a high proportion of Anasazi materials, although absolute numbers are low (table 3).

It is worth noting that stone projectile points were common only on 18-century sites. Where the types are known, a small triangular side-notched form, sometimes with a basal notch, has the highest frequency (fig. 51, a, b, and d). Other tools, also of the sort that metal implements could easily replace, scrapers, chopping tools and cutting tools (fig. 51, c; fig. 50) make up a large part of the remainder. It would appear that metal was scarce, and that chipped stone tools were frequently used. The only lithic evidence of trade with Euro-Americans is a squarish object that looks like a rather crudely made gun flint. As with regard to structure types, the limitations of survey data in this regard are shown by the more complete evidence available from the excavated materials, however.

While waste flakes on the 19th-century sites are proportionately as frequent in the collections as earlier, the number of finished chipped tools is much less. Some bias in the collections may be suspected. It is probable that when fewer artifacts were to be found, the less conspicuous flakes and chips were more likely to be picked up. While the knapping of stone seems to have continued well into this century, metal had begun to replace the native flinty rocks for cutting and piercing tools. Being more valuable because of its scarcity and more easily recycled, no metal objects were discarded casually, even when broken, and no direct evidence of the use of metal was noted.

Grinding implements could not be easily replaced by metal. Manos and metates are fully as well represented in the 19th-century as the 18th (fig. 52).

Material identifications were made by Helene Warren of the stone used for artifacts in my own collections. The varieties included in the artifacts recovered by Vivian and by the Chaco Center intensive survey are not included. The fact that some prehistoric materials are almost certainly mixed with those of Navajo origin makes the intepretation of these data as indicative of Navajo trade contacts very tenuous. The great majority of materials are local, but materials from a diversity of distant areas are well represented only for the 18th century (table 4). Assuming that the contamination of the sample by Anasazi and other prehistoric materials is not excessive, a greater demand for exotic lithic materials would appear

TABLE 3 Lithic Artifacts

TYPES	1700-1800	1800-1868	WWI-WWII	MISC
Projectile Points:				
Small Triangular Side-notched	10	1	—	—
Small Triangular Corner-notched	1	—	—	—
Archaic	1	—	—	—
Unknown Type	16	—	2	1
Scrapers, Miscellaneous Types	11	—	2	—
Notched Scrapers	2	—	—	—
Scaper-Gravers	—	1	1	—
Spoke-shave Scrapers	1	—	—	—
Planers	1	—	—	—
Gun Flints (?)	1	—	—	—
Choppers	1	—	—	—
Chipped Axes	1	—	—	—
Knives	1	—	—	—
Drills	2	—	1	—
Hammerstone	2	—	2	—
Cores	—	2	—	—
Flakes and Chips				
Utilized	11	1	—	—
Waste	19	9	—	—
Manos	1	1	—	—
Metate Fragments	2	1	—	—
Stone Balls	1	—	—	—
Polishing Stone	1	—	1	—
Tchamahia Fragments	—	—	2	—
Shell Items and Beads	1	—	2	—

to be indicative of a greater interest in the industry at the time. The small sample for the 19th century is predominantly of the local origin, 85 percent as opposed to 68 percent for the earlier period. The difference is not great, but the two pieces from outside the area are from the Mount Taylor region, a direction in which contacts are also indicated by ceramic data, and no special effort might have been required to obtain obsidian from that source.

In short, the data are suggestive of extensive replacement of stone by metal about 1800, but the evidence is indirect and subject to uncertainty. As this was a time of increasingly poor relations with the whites, the reason for the increase must be assumed not to have been increased commerce with New Mexico so much as a more plentiful supply of iron for trade among the Spanish colonists.

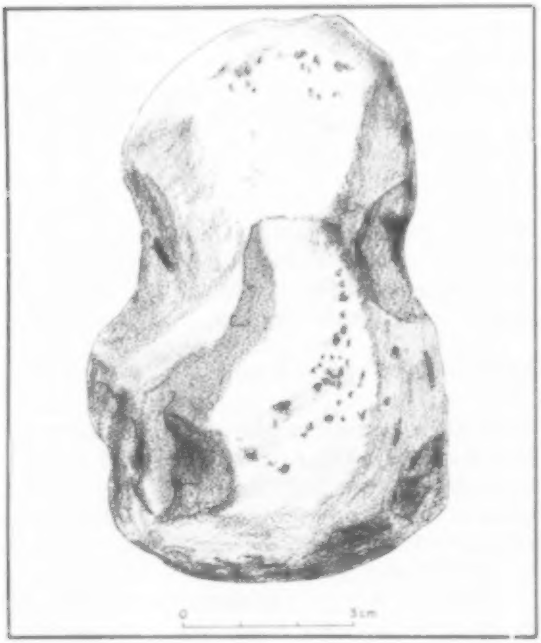
Artifacts of Vegetal Materials

The only object of plant material collected on the survey was a hot rock pusher of juniper from Sweathouse II at Site C. This is a pole about six feet long and two inches in diameter, ax-cut and forked on the distal end. It dates between World Wars I and II.

Collections from previous surveys produced plant materials only from 18th-century sites.

TABLE 4 Lithic Materials

	18th Century	1800-1868
Obsidians:		
Jemez Mountains	2	—
Grants-San Mateo	2	2
Red Hill	4	—
Unknown	1	—
Cherts:		
Local White	3	—
Local Colored	1	—
Local Fossiliforous	1	—
Unknown	2	—
Chalcedonies:		
Local White	3	—
Local Colored	2	1
Washington Pass	1	—
Opals:		
Washington Pass	1	—
Petrified Woods:		
Local White	17	9
Local Colored	6	1
Quartzite, Local	4	—
Basalts:		
Mount Taylor	3	—
San Juan Metabasaltic Greenstone	1	—



Stone maul from interior of Hogan 5, Site K9.

These have been described in earlier reports and are merely listed here:

Site B3 - 1 corn cob
1 wooden handle
7 peeled twigs

Site E1 - 1 juniper weaving batten

Site E9 - 1 notched log ladder

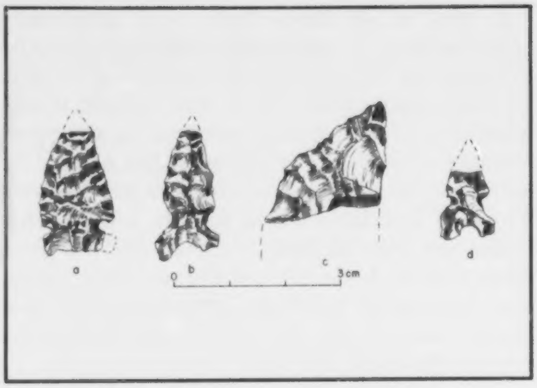
Site K5 - 1 notched log ladder
1 piece of basketry

Tree-Ring Dates

Wood suitable for dendrochronological study was found only on sites on Chacra Mesa. The 30 dates obtained by William J. Robinson at the Laboratory of Tree-Ring Research are given in detail in Appendix A.

A total of 43 dates have been previously reported from Navajo sites in the upper Chaco drainage, giving a total now available of 73 with 19 sites represented. While this sample is not adequate for a thorough analysis of temporal changes in Navajo occupation of the area, it is sufficient to allow some tentative conclusions. The sites and dates are as follows, a UC prefix indicating Navajo Land Claims site designations (Stokes & Smiley 1969:8), a CM Vivian's site designations (Vivian 1960:56), a CH the present survey and an "unknown" Malcolm's survey (Malcolm 1939:10n):

CM 35: Forked-pole Hogan 1:	1350vv 1398vv 1432vv 1469vv 1552vv 1572 + + v 1598 + + vv
CM 150: Forked-pole hogan	1704 + vv
CM 139, UC-N: Fort No. 1	1725 inc
Forked-pole hogan	1725
Provinence unknown	1739c
CH-K5, CM 38, UC-L Pueblito	1600 + v 1659 + vv 1663vv 1722v 1730 + vv *1738vG *1738vLG *1738vLG *1739 inc G 1739c 1739 + v *1739G *1739vL *1739vvL
CM 18, loose wood, base of butte:	1634vv *1726vL 1745 + v
CH-E5, Hogan 1:	1720vv 1745vv 1756 + vv 1769 + + vv
CH-E7, Hogan 4:	1766 + vv
Hogan 5:	1776vv
Hogan 1:	1772vv 1778 + vv
CM 4, Forked-pole Hogan 11:	*1773 + vL 1779 + vv
CM-E6, House 3 Hogan 1:	1747vv 1745vv 1778 + vv
Windbreak 2	1784vv
UC-U, Hogan	1798inc
UC-O, Antelope Corral	1830inc *1840Cinc
UC-T, Hogan 1	*1772 incG
Hogan 3	*1850Cinc
UC-V, Ceremonial Hogan	1839inc li49inc *1849CincG *1850CincG
CH-D9, Hogan 1	1786vv 1791 + vv 1809vv 1852 + + G
UC-W, Hogan 1:	1880 + inc *1884 + incG *1889Cinc *1889CincG *1889CincG
CH-W, Hogan 1	1890 + vv
Unidentified, Stone Hogan:	1888 1895 1898
CH-N, Hogan 1:	1829 + vv 1838 + vv 1863vv 1884 + vv 1906 + v
CH-T, House 1	1868vv 1875 + vv 1921v



Biface chipped artifacts, survey collection.

Mano and metate found at Hogan 7, Site E2.

Very few of the dates were reported with suffixes indicating that the date was definitely close to the time of death of the tree. These have been starred in the list. Altogether, there are 17 such dates from seven sites. While it is usually assumed that such dates are "cutting dates", the possibility that the date of death of the tree does not relate directly to the time of construction of the feature from which it was collected must always be kept in mind. Two circumstances are possible under which the dates would differ. The first is with regard to trees that die a natural death and are harvested at some later date. The other is the salvaging of wood from an older structure, on the same site or from somewhere nearby, for use in the building of a new one. The first case is said by Navajos to be contrary to modern practice, at least in the construction of dwellings, although dead wood does seem to be collected for building corrals and similar features. Despite cultural norms against the use of dead wood, it does occur, perhaps to a limited degree, but field studies are needed to determine just how strictly the ideal standard is adhered to. Usages of the past, especially before metal axes were readily available, are even more uncertain. It will be assumed, however, for purposes of interpretation that most wood was cut by man as living trees and that exceptions were rare.

The second circumstance is of frequent occurrence in recent Navajo usage and is so practical that is is likely to have been a common way of doing things into the past as well. Prior to the introduction of wheeled vehicles, the distance to which salvaged wood could be transported more economically than new wood cut must have been quite limited. A date from a hogan with no evidence of occupation after 1880 is almost certainly evidence of occupation within the immediate area. Even with wagons, transport of logs more than 10 miles must have been extremely unusual, although small roofing timbers for stone hogans built in regions lacking trees may well have been brought from greater distances. Wood in such areas was so regularly salvaged and reused, however, that specimens are seldom present on abandoned sites.

Traditional data from the Chaco region provide some information relevant to the problem. Site P included a house built in the latter part of the 19th century, probably in the 1880's. Vigas for the roof came from ponderosa pine trees cut in Gallo Canyon and transported something over five miles to the site, the full distance depending on how far up the Gallo the trees might have been growing. Sometime after 1910, the site was abandoned. The timbers were salvaged for use at two other sites, N and T. The vigas taken to T had to be moved a minimum distance of two and a half miles and probably closer to three miles due to rough terrain. This site is within about three miles of the original source of the wood, and thus, final deposition was closer to the source than the site where the timbers were first used. Site T, on the other hand, is about one and three-quarter miles from P and in the opposite direction, resulting in final deposition of the wood used there being about seven miles from the place of felling. Knowledge of the movement of these logs aids greatly in the interpretation of the tree-ring dates obtained for the sites concerned, but does not greatly alter the significance of these dates with relation to Navajo occupation of the overall region.

A more certain kind of evidence is provided by the clustering of dates. Where dates are strongly clustered, the probability that they are from trees all cut at about the same time for use in the site from which they come is quite high. Weak clusters may be considered indicative of construction dates, but are less reliable. Only three sites have thus far produced really strong clusters of dates. K5, with nine dates out of 14 being 1738 and 1739 is the best dated site in the series. Seven of the nine dates are "cutting dates" in the traditional sense and cultural features of the site are typical of early 18th-century sites. The dates from a hogan at UC-J also exhibit a strong cluster at 1849-50 and may be considered good evidence of the time of construction, as can the 1889 cluster at UC-W.

More common are the relatively weak clusters from CM 139 at 1725, E7 at 1772-78, an unidentified site at 1895-98, and N at 1883-84. Where consistent with other data relating to the sites, as most of these are, they can be accepted. Where inconsistent with other data or when other information is lacking, as in the case of the unidentified Malcom site, they must be considered tentative evidence at best.

For the earlier sites the tree-ring dates provide the only precise time placement possible, for the typological criteria utilized can do no more than place sites within rather broad time periods. Thus, when the evidence needed to supply confidence in the dates is lacking, it is worth comparing the regional dates with the documented historical record to see whether there is any relationship to events known from history. For the Chaco region, such an exercise (table 5) produces some exceedingly suggestive correlations. In order to avoid using data that are most likely unreliable, no dates were used from periods prior to the 1720's, the earliest appearance of "cutting dates" and weak clusters in this sequence. The dates from one Navajo Land Claim site, E-RP-UP-S, west of La Ventana and not far from the southeastern end of Chacra Mesa, have been included in this tabulation.

On the basis of these relatively limited data, it would appear that there was an increase in population in the Chaco country during the 1720's. This is shortly after the establishment of a stable peace between the Navajos and the Spaniards. The sites include Pueblito-style architecture, suggesting immigration from the Largo-Gobernador country to the northeast where the Pueblo refugees from the Reconquest of the 1690's had settled. These immigrants were probably of mixed descent, part Pueblo and part Athabaskan. Whether there were people of primarily Athabaskan descent already living in the region is uncertain. Population increased and the construction of pueblitos continued into the 1740's.

By 1753 when most of the residents of the Dinetah (Largo-Gobernador) moved out, pueblito construction had ceased in the Chaco region. Warfare with the Utes and Comanches became especially devastating in the late 1740's and 1750's. Construction of any sort appears to have been limited at this time, and it may be presumed that the country was found too exposed to attack by enemies from the north and east for intensive occupation.

Tree-ring dates increase again in the 1760's, reaching a peak in the 1770's. Despite the resumption of warfare with the Spaniards in 1774, occupation continued throughout the decade, but dropped sharply in the 1780's following an especially severe smallpox epidemic. The high proportion of ch'indi hogans noted in the late 1700's suggests that the conclusion that the 1781 epidemic did strike among the Navajos is very likely correct. Population remained sparse, and by the early 1840's, use of the area for hunting suggests that permanent occupants were still few, although perhaps on the increase, a relatively stable population lasting into the early 1850's. Warfare with the whites tapered off somewhat after the United States assumed control of New Mexico in the late 1840's, but the resumption of serious warfare in 1858, followed shortly by the intensive Canby Campaign of 1860 and the Carson Campaign and Fort Sumner Exile, 1863-1868, brought another decline.

This seems to have lasted through the 1870's but there was a spurt in building in the 1880's, perhaps in part due to increased prosperity resulting from the stimulus to trade brought by the extension of railroads into neighboring parts of New Mexico. Collections from later sites did not include many wood specimens.

While this reconstruction is highly tentative, the fact that cutting dates, both weak and strong clusters on sites, and regional clustering of dates coincide well provides reason to give it serious consideration.

TABLE 5 Distribution of Post-1720 Tree-Ring Dates by Decade

1690's		**1693-96**	Flight of refugees to Navajo country.
1700's			
1710's		**1716**	Beginning of peace with whites.
1720's	• • •		
1730's	• • • • • • •		
1740's			
1750's		**1753**	Abandonment of the Dinetah
1760's			
1770's	• • • • •	**1774**	Renewal of war with whites
1780's		**1781**	Severe small pox epidemic
1790's			
1800's			
1810's			
1820's		**1821**	Mexican Independence
1830's			
1840's	• • •	**1846**	Mexican War—US control of New Mexico
1850's	• • •		
1860's		**1863-68**	Fort Sumner exile
1870's			
1880's	• • • • • •	**1880**	Arrival of railroads in western New Mexico, growth of trading posts
1890's	• •		
1900's			
1910's			
1920's			
1930's			

• Cutting date or cluster date.

TABLE 6 Fanual Identification of Bone Waste Recovered in Surface Collection

Period	Site	Species	MFC	Comments
18th Century	B1,Hs7	Antelope	1	Burned, Butchering scars
	E9,5A5	Mule Deer	1	
Late 18th Century	E5,H1	Antelope	1	
	E7,H1	Artiodactyl	1	Well worn teeth
	E7,H7	Artiodactyl	1	Probably sheep or goat
	K9	Horse	1	
1800-1868	E8,SA1	Rabbit	3	1 Immature
		Jackrabbit	1	
	E8,BA3	Cattle/Bison	1	Burned
1868-WWI	K7	Mammal	1	Burned, probably Artiodactyl
	L2	Horse/Ass	1	

Bone

Relatively little bone was recovered in the surface collections, but what little did appear on the surface provides some data of interest. Identifications were made by Thomas W. Mathews and are presented in detail in Table 6. The small collection, only 26 specimens in 11 lots from eight sites, includes a diversity of species. The quantity is so small that little can be said with regard to the data. Assuming that the *Bos/Bison* represents domestic cattle, the more probable choice, domestic animals are represented in the 18th-century, early 19th-century, and late 19th- to early 20th-century sites, while wild animals appear only in the first three of these periods, perhaps a reflection of the decline in hunting after the return from Fort Sumner.

The large number of lagomorph bones, representing at least three rabbits, and one jackrabbit, from Site E8, a site with considerable trash, but no evidence of structures, is of special interest. It is of course not certain that all three deposits at the site are contemporaneous, but a rather temporary occupation seems to be indicated despite the quantity of trash. The pottery would be evidence against accepting this as a hunting camp and the presence of bone from either cattle or bison would not be expected in a hunting camp in this region.

If the absence of structures is real and the deposits contemporary, the best explanation would seem to be that it was the camp of a family that abandoned its home due to a crisis situation, perhaps a war or epidemic. The location high on Chacra Mesa would be a suitable place in which to seek refuge from enemies and would provide a good camp site at any time of the year with its sheltering pinyons and junipers. While excavation might not provide the answers, the site is one that would be worth testing.

At three of the sites burned bones were collected—B1, E8 and K7. Only at the first of these were butchering scars evident on a bone, but it is probable that all are the remains of animals used for food. All are from species which the Navajos are known to have used for this purpose, although cattle, bison and horses were not as regularly butchered as were the others, the two former species due to their rarity and the last because it was valuable for other purposes. With regard to the horse bones, an alternative is that these are from horses killed as part of funeral ritual. At K9, there is a possible grave and the failure to make use of the hoof found at L2 might have been because the animal was a burial offering. The lack of more complete skeletons, especially at a site as recent as L2, however, makes the first interpretation seem the more likely one.

Conclusions

The temporal distribution of site features and significant dimensions is presented in Tables 7 and 8. Archeological evidence of occupation during the very early historic period

TABLE 7 Distribution of Site Features by Period in the Extensive Survey

	NAVAJO							WHITE		
Site Features	18th Century	1800 to 1868	Post-FS to WWI	1880 to WWII	WWI to WII	Post-WWII	MISC	Span-Amer.	Anglo-Amer.	COMMENTS
Pueblitos	5	—	—	—	—	—	—	—	—	
Houses	9	—	7	2	11	2	—	—	6	
Hogans: Stone	26	7	13	14	35	2	—	—	1	
Forked-pole	10	2	1	—	—	—	—	—	—	
Cribbed-log	1	1	2	—	1	—	—	—	—	
Vertical-log	—	—	—	2	1	—	—	—	—	
Ring only	6	1	4	—	14	1	—	—	—	
Trading Posts	—	—	—	—	—	—	—	2	2	
Dugouts	—	—	—	—	—	—	—	—	2	
Chapter Houses	—	—	—	—	1	—	—	—	—	
Camp sites (various)	6	1	1	—	5	1	3	7	2	
Corrals & Sheep Beds	2(?)	—	9	5	25	3	1	10	4	
Lamb Pens	2(?)	1	1	2	7	—	—	2	—	
Barns	—	—	—	—	—	—	—	—	1	
Chicken Coops	—	—	—	—	—	1	—	—	1	
Fortifications & Battle Sites	3	1	—	—	—	—	2	—	—	
Small Storage Structures	—	—	2	1	1	—	—	—	—	Bins, Granaries, Platforms, Etc.,
Dams	—	—	1	—	—	—	—	—	—	
Ovens	—	—	2	—	25	1	—	1	—	
Sherds areas, etc.	3	3	—	—	4	1	—	—	—	Includes Isolated ash heaps & trash areas
Trails	1	—	—	—	1	—	—	—	1	
Roads	—	—	—	—	1	—	—	—	2	
Cairns	1	—	—	—	3	—	—	—	1	
Antelope Corrals	—	2	—	—	—	—	—	—	—	
Sweathouses	1	2	—	—	3	—	—	—	—	
Rock Art	2	1	2	2	3	—	5	9	2	
Emergency Shelter	—	—	—	—	1	—	—	—	—	
Mines & Quarries	—	—	—	—	1	1	—	—	1	
Isolated Graves	4	—	—	1	—	—	—	—	—	
Cemeteries	—	—	—	—	—	—	—	—	1	Includes Navajo & Span-Amer. Graves as well as Anglo
Miscellaneous	5	—	1	—	—	—	1	1	—	

TABLE 8 Hogan Diameters and Ash Heap Distances by Period from the Extensive Survey

HOGAN DIAMETERS

Period	Averages	Mode	Range	N
Post-WWII	18.3′	20′	15′-20′	3
Post WWII-WWII	15.0′	15′	11′-20′	43
1800-WWII	13.4′	15′	9′-20′	14
Post 1868-WWI	13.2′	15′	8′-17′	19
1800-1868	11.1′	10′	9′-15′	11
1750-1800	11.2′	10′&12′	9′-18′	24
1700-1750	10.7′	10′	8′-14′	16
ASH HEAP DISTANCES				
Post-WWII	71.6′	75′	65′-75′	3
Post WWI-WWII	65.0′	60′	20′-200′	43
1880-WWII	57.8′	65′	32′-95′	6
Post 1868-WWI	43.5′	ca. 60′	5′-105′	11
1800-1868	—	—	—	—
1750-1800	11.9′	15′	5′-15′	12
1700-1750	20.2′	18′-20′	8′-35′	4
Pueblitos	47.5′	—	40′-55′	2

has not been identified. Whether the lack is due to an absence of people prior to 1700 or our failure to recognize the signs of their camps is still uncertain. By 1720 or so, there were Navajos of mixed descent settling along Chacra Mesa, primarily near the mouths of small canyons draining northeasterly into the Chaco River. They built a number of small pueblitos during the ensuing decades, the architectural features of which resemble the pueblito styles of the Largo-Gobernador country where numerous Pueblo refugees had settled among the Apaches de Nabajó, as the early Navajos were called, about a generation earlier. Immigration from the northeast thus appears well established. The Chacra pueblitos were situated close to lands that could be cultivated and usually on heights where a view of the surrounding terrain and defense from attack were possible, but the concern for defense was not an overwhelming factor in either locations or construction.

Winter camps at higher elevations on the mesa consisted largely of hogans and seem to have been placed where the woodland gave shelter from the weather and allowed easy access to firewood and hunting. In the lower camps, some stone construction was done, but wood was the usual building material and the forked-pole hogan the preferred form.

Navajo pottery was present in some quantity, but most was Dinetah Utility. Very little decorated ware of Navajo manufacture is found on these sites, but there was active trade with Pueblo peoples, particularly at Zia, Acoma and Zuni, for painted ceramics.

The people probably had a well developed lithic industry of their own and gathered or traded for rocks of good quality for chipping from over a wide area.

Obsidian from Red Hill far south of Zuni may indicate contacts with the Chiricahua Apaches. The most common products of stone work were arrow heads and scrapers, but most implements required for piercing, cutting, drilling, grinding and pounding were probably manufactured of stone. While metal was in use among the Spanish colonists, it was apparently in such short supply that little reached the Navajos in trade. Peace with the Spaniards during this period should have allowed trade to flourish. Excavated materials do indicate that some metal was reaching the Navajos. One object of local petrified wood that may be a rather crude gun flint suggests that some

European goods did reach the Navajos, but none were found to show the trade nor would a gun have been a legal trade item under Spanish rule. The artifact might also have been the flint from a flint and steel strike-a-light, again indicative of some metal obtained through trade.

The few bones from surface collections of this period indicate only use of game animals, but there is historical documentation of Navajo use of domestic animals as well, and the sample size is obviously inadequate. The question as to whether these specific Navajos had livestock cannot be answered on the basis of the data. Buckskin was a frequently mentioned trade item during this time. Hunting may have been on a large scale to obtain hides as a result.

Settlement seems to have been somewhat later toward the northwest end of the Chacra and on South and West Mesas, but dendrochronological materials from the sites in this direction have been few and difficult to date. If the indications of our limited tree-ring dated sites are representative, then construction of pueblitos ended about 1750 and population may have been relatively sparse during the mid-portion of the century. By the 1770's, however, there were many occupied sites, most conforming to the more traditional view of Navajo life, hogans being the favored home.

Bones are somewhat more plentiful on sites of the latter part of the century, but still not common. Antelope, horse and possibly sheep or goat are represented. Most of the sites are in the wooded higher elevations, less well located for farming.

A war with the New Mexicans in 1774-75 may not have altered settlement patterns greatly, but it is likely that the smallpox of 1781 caused many deaths and perhaps led to a drastic decline in the population of the region. Several sites with tree-ring dates in the 1770's include burials or hogans abandoned due to death, and dated sites are quite sparse until well into the next century.

During the early to mid-19th century, warfare with the whites was a major concern and such habitation sites as are found are normally in out of the way, even well-hidden, locations. There are hints that, during much of this period, habitation was extremely sparse and the country utilized primarily for hunting. The only antelope corral in the region to produce tree-ring dates was probably built about 1840. Navajo tradition indicated few people, good range and plentiful game for the latter part of the period at least. The latest occupation was quite specifically said to be by families hoping to remain undiscovered by white troops.

Some sites did provide fairly easy access to places where crops could be grown, but hunting and gathering were relatively important. Again, the bone collections are small, but include only rabbit, jackrabbit and either cattle or bison. Both tradition and one lamb pen indicate the raising of sheep, but obviously on a very small scale.

Trade was limited. Despite an increasing supply of Euro-American goods along the Rio Grande, especially after the opening of the Santa Fe Trail, and the presence of some trade goods that could date prior to the final treaty on later sites, no certain evidence of such goods on sites of the period appeared. The decline of the lithic industry was rapid, however, and trade for exotic stone ended, suggesting that metal was reaching Navajo hands in sufficient quantities to replace lithic materials for most needs. It was doubtless considered too valuable to waste when a tool broke or wore out and was hoarded and reused for new artifacts.

Navajo utility ware supplied the need for most cooking vessels. Trade for decorated Pueblo pottery continued.

Two defensive sites may date from some time in the period, but objective criteria for placing them are lacking and an 18th-century date cannot be ruled out. The people of the region seem generally to have been removed to Fort Sumner during or after the Carson Campaign, the final Navajo war.

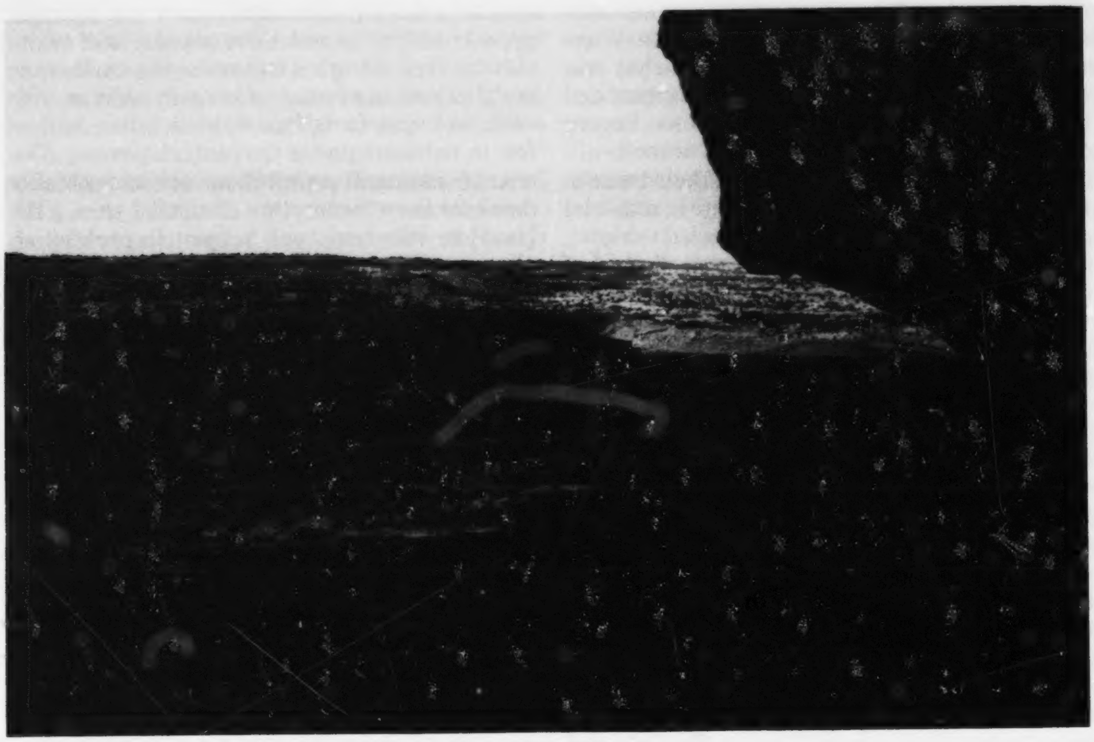
Return to the area is said to have been shortly after the release from captivity, certainly by the 1870's, although tree-ring dates have not been obtained thus far to demonstrate occupation before the 1880's. With the wars ended, population growth was rapid and trade expanded. Summer camps near farms and winter homesites at higher elevations were the rule. With the beginning of trading posts and their easy supply from nearby railroads, old crafts were practiced less. Sheep raising and weaving became the route to material well-being and corrals began to be common. Firearms led to decrease in game locally and the lithic industry was lost entirely. Basket making also rapidly became a lost art, although ceramic manufacture continued on a very small scale and trade for Pueblo wares did not cease. Wage work was open to some, but the market was small and variable. Hogans were larger and houses again came into fashion. Some luxury goods such as alcoholic beverages were available despite official prohibition on their trade to Indians. The most important change in material culture was the acceptance of wheeled vehicles, allowing more flexibility in the choice of homesites.

Although peace opened the region to easier utilization, an influx of white settlers and stockmen was the beginning of a long lasting competition for the land and its resources.

World War I and the flu mark the end of a period of adjustment to a flood of changes that seemed likely to submerge Navajo culture. During the period between the wars, there seems to have been a return to a more Navajo way of life. Houses lost their popularity to some degree. Hogans were larger and better built than ever, sometimes having doors, windows, stoves and double-faced walls of cut stone. The use of Spanish *horno* ovens to cook bread of wheat flour increased remarkably. Corrals are more frequently found on the sites. By the end of World War II, however, stock reduction and the loss of the use of over half the land in the region to whites had made the people heavily dependent on wage work. The organization of chapters during the 1930's gave the Navajos greater ability to resist the pressures of white society, even though it took some time to learn to use this new institution effectively. Automotive vehicles began to replace wagons, but remained few in numbers due to the people's poverty. The era of national prohibition did not notably decrease the consumption of alcohol among the Navajos, who had been subject to prohibition already and who undoubtedly were at least as well prepared as the whites to evade the law when they so desired.

There is a distinct patterning of greater association of whiskey jugs with houses than with hogans, indicative of proportionately more use of the beverage by the more acculturated and presumably more prosperous families or perhaps a greater tendency on the part of the men of such families to do their drinking at home.

Few postwar sites were recorded, obviously a factor of their recency, fewer abandoned sites of the period existing as yet, and of an emphasis in the field work on older sites. The small sample is not adequate for conclusions of significance, but trends of previous periods such as increases in dwelling size and in ash dump distance seem to continue. If the proportion of houses to hogans is at all representative, the construction of houses again began to gain on hogans very early, a shift in housing that is certainly true today.



View of Site B1 from fortified boulder top at Site 29 SJ 567.

Part II

The Doll House Site

Introduction

The Doll House Site, named for a minature structure associated with it, is a multicomponent Navajo site located at a bluff (fig. 53) on the south side of Chaco Canyon in the southeast quarter of Section 26, T21N, R10W, NMPM. It is slightly east of south of Wijiji, a Classic Period Anasazi pueblo on the north side of the canyon. It is at Longitude 107 degrees 51 minutes 3 seconds West, Latitude 36 degrees 1 minute 0 seconds North, covering a fairly extensive area on and below the bluff. The bluff is capped by Cliffhouse Sandstone underlain by the Menafee Formation, the latter including some coal deposits.

The vegetation on top of the bluff is a very sparse pinyon-juniper woodland, with juniper predominating among the trees, and shrubs and herbaceous plants providing most of the ground cover. The soil is very shallow and bedrock is exposed in many places. On the talus slopes is an *Atriplex-Oryzopsis-Sporobolus* shrub-grassland association. The floor of the main canyon has a *Sarcobatus-Sporobolus* shrub-grassland, while the small canyons flanking the bluff support an *Atriplex-Sarcobatus* community. As one proceeds toward the higher elevations of Chacra Mesa to the south, the woodland becomes thicker until the upper flat area of the mesa is reached where an extensive area of grassland is encountered. The mesa top on the north side of the main canyon and a few of the lower points of Chacra Mesa are covered by the *Hilaria-Bouteloua* grassland (Potter, 1974).

A diversity of plants of economic value to the Navajos is found in these varied environments as well as in small, isolated stands with exceptionally good shelter and water supply not far from the site. Navajos planted crops near the mouths of both side canyons within living memory, and it is probable that a similar use was made of the land in the proto-historic period. The Chaco River is now deeply entrenched in an arroyo down the center of the canyon where some willow and tamarix are found, the latter a recent introduction. Most of the ground supports vegetation suitable for grazing and browsing animals.

Trees on the bluff top grow most commonly along cracks in the bedrock where more soil has accumulated. The few pinyon trees are especially stunted and branchy. Cliff rose, three-leaved sumac, mountain mahogany, salt bush, greasewood, wolf berry, *Echinocereus*, *Mammalaria*, prickly pear, a narrow-leaf yucca, princes plume, an *Astragalus* or *Aragalus* species and various grasses were noted on the site.

Common vegetation on the lower slopes of the mesa include juniper, mountain mahogany, a sage brush (*Artemesia nova*), Mormon tea, rabbit brush and snakeweed. Of the grasses, *Hilaria Jamesii* and *Muhlenbergia pungens* are most frequent, but *Oryzopsis hymenoides* and *Bouteloua gracilis* are also present. *Artemisia frigida*, another sagebrush, is very common along the cliff rims and probably occurs on the site or very nearby (Struever and Cully, personal communication).

Rincons, canyon heads, and springs near the site in the side canyons have currant, alder, cottonwood, and cattails as well as wolf berry, three-leaved sumac, salt bush and greasewood. The yield of berries in these localities for those species found in both places is noticeably greater than on the bluff top.

There are at least three springs near the site. To the southwest in the west fork of the small canyon on that side is Todik'ǫǫzhi, "Sour Water," located just outside the Park boundary.

This is a flowing spring that emerges from the contact zone between the Cliffhouse Sandstone and a layer of low grade coal. It carries sufficient coal so that the bed of the little stream formed is black in color, but the water sinks into the soil long before reaching the wash in the center of the canyon. There is a good growth of cattails along the stream, however, suggesting that the flow is rather reliable. Cliff swallow nests on the rock above and deer tracks indicate that the water is attractive to wildlife. To the southeast up the canyon on the opposite side is a spring known in Navajo as *Náshdóí Bitoo'*, "Wildcat's Spring" (Fransted and Werner, 1975), and farther to the east is *Tó Nichó'í*, "Stinking (or Bad) Water" (Ibid.). One of these, probably the former, is a seep spring under a large overhang where the upper east fork of the canyon boxes. It has been dug out, and at times, the reservoir thus formed holds considerable water, but it is subject to great fluctuation and is dry during years of sparse precipitation. There is an unrecorded Navajo site consisting of three hogans and a sweathouse near this spring. Occupation was probably in the period between World War I and World War II.

There are also a few rather small potholes along the upper portions of the east canyon where it cuts through sandstone outcrops. These are cavities worn into the bedrock by seasonal runoff and hold water for short periods immediately after rains or thaws. Other seasonal or periodic sources of water are the occasional snows, particularly on the higher elevations, during winter, and the runoff in the Chaco River during the later summer rainy season. The Chaco drains a sufficiently large area to insure often a continuous flow from July into October. While water can be obtained by digging in the arroyo bed at any season, the depth is frequently below what could have been easily reached with the tools and equipment available to the residents prior to the late-19th century.

The Site

The site includes a number of components and extends over a rather large area. It has been variously recorded by different surveys which have divided it into a greater or lesser number of separate sites, the lines between these parts sometimes overlapping. In order to have better control of the entire range of historic material, all of the Navajo and Euro-American features on the bluff or immediately below it have been lumped under the name Doll House Site. Five Anasazi components also fall within this area. These will not be considered in the present report, but their presence should be noted. They include Site 29 SJ 1614, a Pueblo III three-room storage structure in the cliff on the east side of the bluff, an Anasazi component of 29 SJ 1637 consisting of a three-room pueblo and possible kiva dating to Pueblo II-Pueblo III, 20 SJ 1638, a seven-room pueblo with kiva and trash dump both below the bluff on the northeast, and a small deposit of Anasazi trash near Hogan 8 and a slab-lined cist of probable Basketmaker origin near the arroyo south of Hogan 15. Except at Hogan 8, there is little mixture of Anasazi and Navajo materials. The site was chosen for excavation in part because it was believed that the two could be kept generally separated, allowing for better definition of the lithic collections as Navajo than would have been possible on some alternative sites. The site was probably included by Farmer (1939) in his 1937 archeological survey of Navajo sites, but certain identification is not possible on the basis of his report.

Vivian (1960) did record the 18th-century components in considerable detail and included one structure that probably dates much later. All structures noted by him were recorded as parts of one site, CM 23. In 1968, George Buckingham recorded three of the structures as individual sites, assigning them the numbers Bc 386, Bc 387 and Bc 388 in the Park's survey. The intensive survey of the Chaco Center listed most of the features on top of the bluff as Site 29 SJ 1613 and most of those below the bluff to the east as Site 29 SJ 1637. Hogan 14 was first recorded as a part of 29 SJ 1639, but later included under 29 SJ 1613. The Doll House itself was recorded as 29 SJ 1644. On my extensive survey, I initially recorded the structures in the portion of the site labeled CM 23 by Vivian as Chaco-B1, later expanding the B1 designation to take in a more extensive area to the south in order to correspond better with the 29 SJ 1613 designation. My ultimate solution has been to include all historic features under the site name, which will here be used as synonymous with Chaco-B1. Since the excavated portions of the site are largely within the confines of 29 SJ 1613, that site number has been used for integrating the materials recovered into the Chaco Center collections. The following tabulation correlates the various features (fig. 54) as nearly as is possible on the basis of the data in the different survey records:

Doll House Site	CM 23	Chaco Center	Buckingham
Hogan 1	J	+	Bc 388
House 2	I	+	—
Pueblito 3	F	+	Bc 387
House 4	G	+	—
Rockshelter 5	—	+	—
Check Dam 6	—	+	—
House 7	E	+	—
Hogan 8	C	+	—
House 9	A	+	Bc 386
Hogan 10	D	+	—
Check Dam 11	—	+	—
Pot Hole 12	—	—	—
Cairn 13	—	+	—
Hogan 14	—	+	—
Hogan 15	H	—	—
Hogan 16	—	+	—
Hogan 17	—	—	—
Sherd Area 29	—	—	—
Hogan 18	—	+	—
Hogan 19	—	+	—
Granary 20	—	—	—
Granary 21	—	+	—
Structure 22	B	+	—
Trail 23	—	+	—
Hogan 24	—	+	—
Hogan 25	—	+	—
Corral 26	—	+	—
Corral 27	—	+	—
Doll House 28	—	+	—

A number of minor features below the bluff were not investigated during the work reported here and will not be assigned numbers. These seem to consist primarily of storage structures or lamb pens, perhaps both.

Related Sites

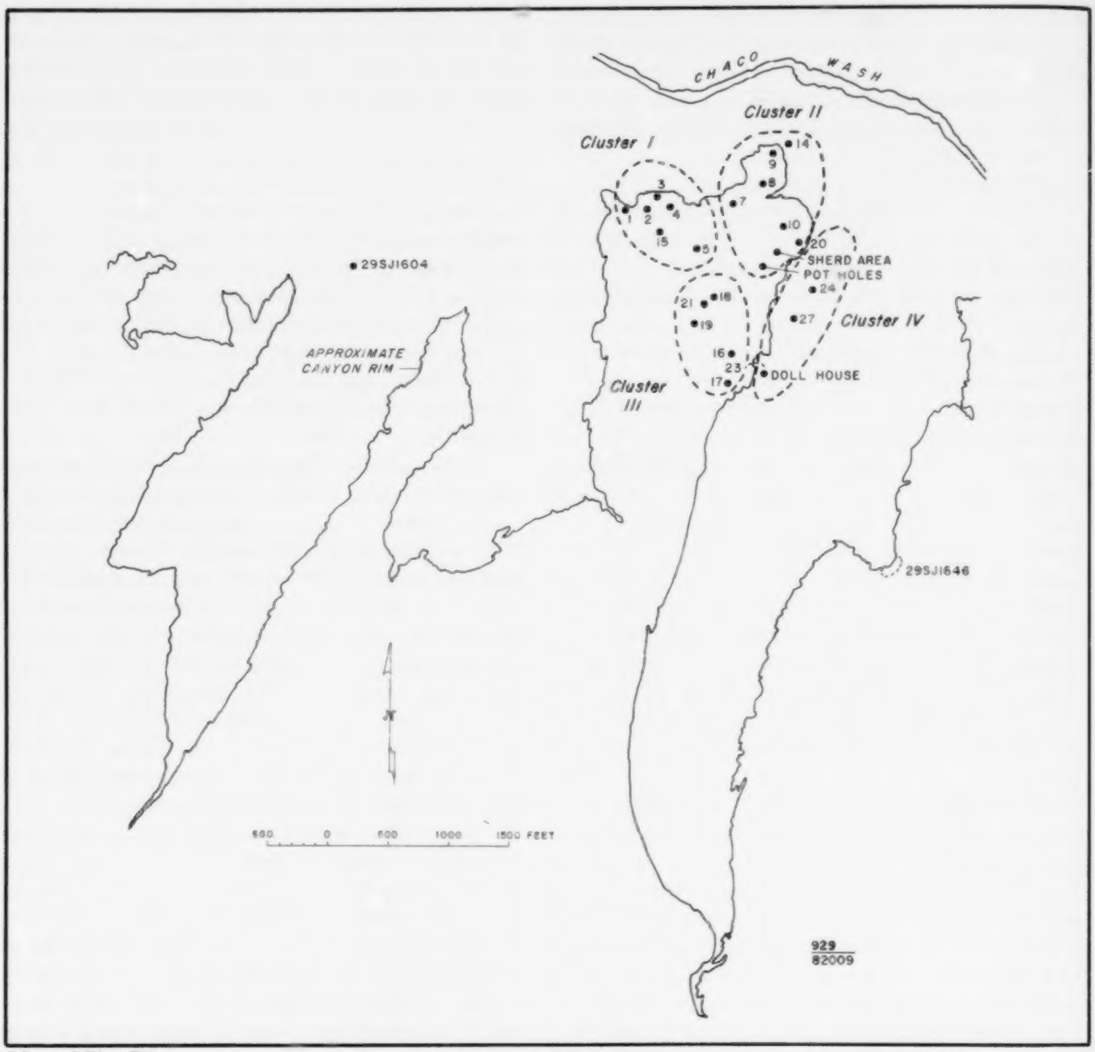
A number of nearby historic period components are indicative of Navajo land use and relate to some degree to the occupations at the Doll House Site. Near *To Dík'ǫ́ǫ́zhi* is 29 SJ 1620 which includes two poorly preserved stone hogans, a fence and log troughs at the spring, a trail to the spring, a structure between two boulders that was probably a lamb pen, a hearth, and rock art. The hogans and lamb pen are probably remains of Navajo George's occupation here in the late-19th and early-20th centuries. The other features are of less certain origin, but use of the spring by both Spanish- and Anglo-Americans is suggested by inscriptions and other remains.

On the west side of the mouth of the small canyon west of the bluff is a stone hogan, 29 SJ 1604, Site L, which was occupied by Willie George, a grandson of Navajo George. This occupation appears to have been contemporary with the occupation of the recent structures at the foot of the bluff on the east by his sister's family. The latter is included as a component of the Doll House Site.

Across Chaco Canyon and a little upstream from the bluff is a defensive retreat built on the top of a large slump boulder close to the cliff. This is Site 29 SJ 567 or G9. There are two possible hogan foundations nearby, one at the base of the boulder on a small bench of the talus and one near the mouth of the rincon immediately east of the boulder. Except that these can be attributed to a time when the Navajos still were engaged in warfare with other peoples, they cannot be dated. Contemporaneity with one of the earlier components at the Doll House Site is probable, however.

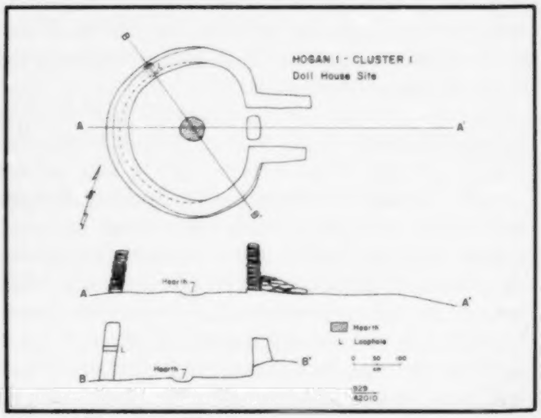
A fortified rock shelter that would also have served as a refuge in times of danger is located on the east side of the small canyon east of the bluff at the head of a shallow rincon (fig. 55). It is Site 29 SJ 1646 or G8, and its relation to the occupation of the Doll House Site is probably similar to G9 on the south side of the main canyon. It seems more likely to have been actually used by residents of the site, however, since access to it from the bluff would have been easier and with less chance of observation by enemies.

Almost due south of the Doll House Site, following up the ridge of which the bluff is the lower terminus, there are three rock shelters just outside the Park Service fence in which hogans or camps once existed. The shelters face north, suggesting that they were better adapted to use as campsites during hot weather than as hogans. Some modern trash indicates use by recent sheepherders or perhaps by the fence crews. Recorded as 29 SJ 1615, the only datable materials recovered suggest use after 1930, perhaps best attributed to the fence crews or


CHACO WASH
Cluster I
Cluster II
Cluster III
Cluster IV
1
2
3
4
5
7
8
9
10
14
15
16
17
18
19
20
21
23
24
27
SHERD AREA
POT HOLES
DOLL HOUSE
29SJ1604
29SJ1646
APPROXIMATE CANYON RIM
N
500 0 500 1000 1500 FEET
929
82009

Map of Site B1.

Fortified retreat, Site 29 SJ 1646(G8).


HOGAN 1 - CLUSTER 1
Doll House Site
A
A'
B
B'
L
Hearth
Hearth
Loophole
0 50 100
cm
929
42010

Map of Hogan 1, Cluster 1.

later boundary patrol activities. Earlier use is more problematical, but probably did take place.

Beyond the Park boundary on the south are at least two sites dating during the first-half of this century. The site near the seep spring has been noted above. About one-quarter mile northwest of this is Chaco-K consisting of four hogans, two corrals, a granary and a rock shelter. The latter was one of Willie George's winter camps and was occupied until about 1934. The former was probably another winter camp of the same extended family. George and his sister, Mrs. Rafael Mescalito, seem to have shared most of the sites at the higher elevations. Site K is said to have been abandoned when *To Dík'ǫ́ǫ́zhi* Spring was fenced, suggesting that the fence now there was the work of Anglo-American ranchers.

There are many other sites over a much wider area that were used by the George family from the return from Fort Sumner into the 1930's and 1940's. A similarly extensive land use pattern by the earlier inhabitants of the Doll House Site is not unlikely, but in general, data aside from geographical proximity are lacking to define these intersite connections. Of early sites at a distance, only the antelope traps at D1 and D2 were specifically cited by local tradition as being used by occupants of the older components. While this shows exploitation of resources at distances up to 12 miles or so, it is in an activity that would have required participation by many adults from a relatively wide area as a community activity rather than being restricted to the personnel of one extended family such as probably resided at the Doll House Site. For the present, at least, we lack the techniques that would allow us to discern the intersite relationships that existed in the 18th and early-19th centuries when traditional data are lacking. The problems of seasonal movements, homesite relocations and family or clan ties with neighboring people can merely be inferred on the basis of analogy with traditional and modern Navajo usage. They remain very real and relevant questions, however, and should not be ignored.

Research Design

The research design was not an especially rigorous one. Since this was the only Navajo site excavated during the course of the Chaco Project, attention was given primarily to intrasite relationships in hopes of defining the relative temporal relationships of the structures and learning something of the composition of the social groups involved in their use. The initial concept was that of long-term occupation; but as work progressed, it appeared more likely that use of a more transitory sort such as camping should also be given consideration.

The wide spacing between structures precluded any hope that stratigraphic evidence would supply information on the intrasite sequence. The extremely shallow sandy fill only served to emphasize this fact. Thus, other approaches to the problem of sequence were sought.

Initially, an outline of problems particularly pertinent to Navajo culture history was prepared. The first main heading was "flexibility," a recurrent theme in Navajo studies (Aberle, 1961; Shepardson and Hammond, 1970). Alternate solutions to fulfilling various needs for shelter, subsistence, firewood, defense and religion were noted, followed by a listing of kinds of adaptability required by weather and climate, availability of resources, potentials of the technology for mobility and the kinds of threats posed by enemies. A second major heading concerned socio-political structure and the various levels of organization that have prevailed among the Navajos as well as the composition and size of various groups. A third major heading concerned the natural environment and included, in addition to the usual subjects such as precipitation, erosion, water sources, growing season, flora and fauna, two generally overlooked phenomena, disease agents and domesticates. The fourth category involved interethnic relations, encompassing warfare, trade, visiting, intermarriage and diffusion as an independent tribe and a consideration of similar and related matters as a dependent people under white rule. The next heading was concerned with the ethnic composition of families, outfits, communities and regions. The final three headings were for demography, religion and continuity.

As an overview of Navajo culture history, this outline did help organize my views with regard to Navajo archeology in general. It was far from being a scheme immediately adaptable to the proposed excavation, however. Certain assumptions were made on the basis of a study of the site maps. It was clear that the various features fell into discrete groups based on mutual propinquity, and these were designed as "clusters" with the expectation that each cluster would prove to be a separate component of the site and that it would be possible to separate them in their relative temporal order. The clusters were defined as follows:

Cluster I	Hogan 1
	House 2
	Pueblito 3
	House 4
	Hogan 15
Cluster II	House 7
	Hogan 8
	House 9
	Hogan 10
	Granary 20
Cluster III	Cairn 13
	Hogan 16
	Hogan 17
	Hogan 18
	Hogan 19
	Granary 21
	Trail 23
Cluster IV	Hogan 24
	Hogan 25
	Corral 26
	Corral 27

A number of features, especially when their locations provided somewhat ambiguous indications as to their associations, were omitted from this classification. It was hypothesized that there had been recurrent occupations and that a sequence about as follows might emerge:

Cluster II	250 years old
Cluster I	200 years old
Cluster III	150 years old
Cluster IV	50 years old

This hypothesis inherently requires all or most structures within a cluster be contemporary, at least overlapping in time. It does not require a break in occupation between the abandonment of one cluster and the occupation of another, but would obviously be somewhat easier to demonstrate if this were the case. Only for Cluster IV did strong objective data exist, however, prior to excavation. It was anticipated that tree-ring dates, archeomagnetic dates, or both would provide a test of this sequence.

A second hypothesis was that the sequence represented a distinct group, probably matrilineally defined, each cluster having been occupied by an extended family of a different generation than that preceding and following. Cluster size, intracluster similarities and intercluster differences were expected to help evaluate this hypothesis, special attention to be placed on items associated with activities of female residents.

Another hypothesis was that each cluster would reflect the degree of danger apprehended from attack at the time of its occupation and that defensive precautions would correlate with the kind of attacks expected. Of secondary interest in this regard was whether the kinds of weapons possessed by enemies or the kind of organization the enemies could mobilize for warfare might be the decisive factors. An analysis of the defensive strategies employed in the various clusters was thought adequate to address this question. The historic record provides good control of changes in opposing forces on a temporal basis.

With regard to economic variables, the major hypothesis was that most food items were available in the local environment and that relative importance of differing subsistence activities would vary in response to weather, and during the earlier periods, the threat of enemy attack. After conquest, political and economic factors within the dominant society would exert a strong influence. Ultimately, dependence on imported foodstuffs would permit a much greater population than could be supported by the land itself. Local food production would become increasingly oriented toward domesticates, both plant and animal.

It was hoped that there would be sufficient recovery of bone and pollen and other plant parts to show changes through time in emphasis on varying subsistence endeavors and that both pollen and dendrochronological data would be available to permit inferences with regard to climate.

The economic aspects of trade were expeced to be evident in an inverse correlation of trade goods with warfare, that preconquest (1863-64) trade would be primarily for luxury goods and postconquest trade goods would include necessities, expecially with the shift to a cash economy. Evidence of alcoholic beverages was not expected to appear until after the return from Fort Sumner.

Care was to be taken to note all indications of religious practices that might be identified with customary procedures in Navajo ceremonies still practiced, but it was realized that the chances for finding such evidence were slight. Traditional ways grounded in Navajo theology would be more easily recorded and could be matched against the degree to which they were observed in the past for evidence of change or continuity in religion. Four kinds of evidence were considered significant:

- —Hogan entries should face sunrise at the time of construction. Any entryways that deviate from the local annual variation in direction of sunrise require explanation.
- —Broken pottery should be disposed of at a distance from the hogan, not in the ash dump. A scarcity of ceramics recovered from the ash dumps would indicate either an extension of this custom into the past or a relative unimportance of pottery at the site. Conversely, abundant sherds from the trash would show that this custom was not observed by the residents.
- —Dwellings should conform to the traditional Navajo concept of a hogan as defined by Blessingway. To the extent that they do not, it may be presumed that Blessingway had not yet developed to its full form or that the residents of this site did not accept this ceremony as influencing their lives.
- —Hogans in which a death had taken place would have the north side breached, the entry blocked, or undergo other special treatment. Presence of these features could show continuity in burial practices, but absence would probably be meaningless.

The problem of occasional occupation did not appear primary. Site location was strongly indicative of summer occupancy, but the question of winter occupancy remained open. Pollen, maturity of faunal remains, degree of growth of the final ring on any good tree-ring specimens and hogan orientations seemed the best sources of evidence that might help settle the matter.

A final consideration was to test for functional differentiation of space in and around the dwellings. In traditional Navajo culture, this sort of arrangement of space within a hogan helped facilitate family life by prescribing which portions of the one-room structure were used by whom and for what purpose under varying circumstances (Kluckholm and Leighton, 1962). Excavation was by quadrants in order to test the proposition that cultural remains would be found in a spacially patterned distribution compatible with traditional Navajo usages if the custom had prevailed at the site. Patterned artifact scatter in exterior space would require interpretation if it should differ from the presumably "logical" expectation that most outdoor activities would take place in front of the hogan.

With these problems in mind to help guide recovery of data, it was decided to give priority to Clusters I and II. The remains at Cluster III were so sparse that only one hogan appeared worth excavation, but it was hoped to include this in the work. Hogans were to be excavated as a portion of 10-meter broadsides laid out in four, five-meter grids centering on the entries. Extension of excavation were where necessary to include ash dumps. Neither time nor the shallowness of the fill permitted this ideal approach, but enough exterior area was cleared to provide some evidence of exterior activities, if not an understanding of them.

Pollen and flotation samples were regularly taken, but no analyses were available when this report was written. In addition, samples of charcoal were kept from each structure and these have provided some useful information. The few potential tree-ring specimens, very poorly preserved, were not datable, and the hearths were too sandy for collection of adequate archeomagnetic samples. Overall, the quantities of organic material recovered were disappointingly small with the exception of bones and are of little value for statistical manipulation.

The excavations, which were restricted to Clusters I and II, will be described by structure along with the description of the architecture. Unexcavated features will be described in numerical order with the excavated structures, and the data on materials recovered will follow.

Architecture

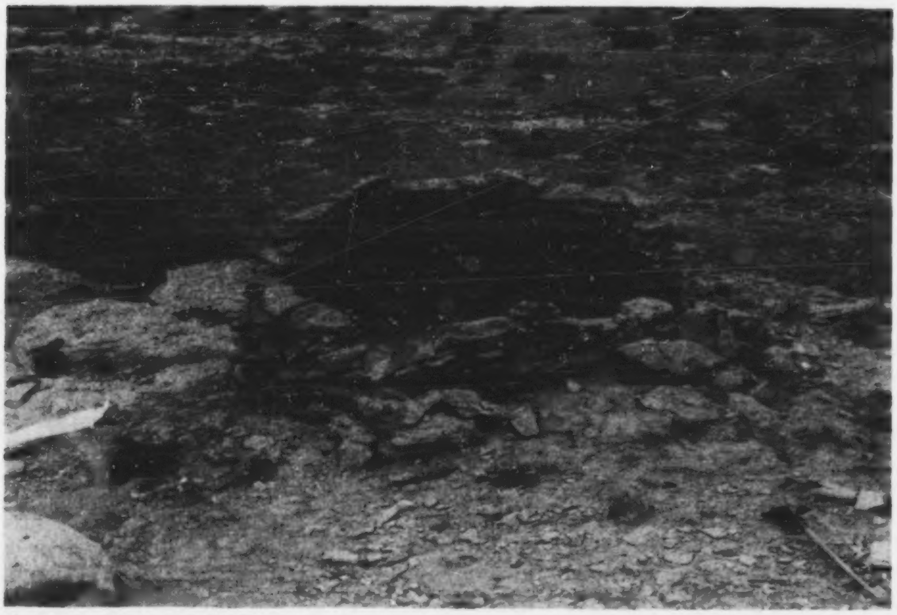
Hogan 1 (fig. 56).

Hogan 1 is situated at the western end of the site close to the rim of the bluff and commanding an approach up a sloping ridge. It is built of thin to moderately thick dark sandstone slabs set in mud mortar, much of which had been washed away by rains. Existing wall height varied from 67 centimeters to 118 centimeters. The entry is oriented 70.5 degrees east of true north and is provided with a stone entryway or vestibule which extends out from the front wall 100 to 113 centimeters. The ground plan is roughly circular. Floor diameter varies from 3.02 to 2.77 meters. The wall in the rear part of the structure was built so that it leans inwardly at an angle of almost 10 degrees from the vertical. There is a loophole in the northwest wall measuring about 18 centimeters wide by eight centimeters high and 63 centimeters above the floor. This loophole faces the trail up the ridge. A second hole in the rear wall near the floor may also have been intended as a loophole, but may be merely the result of erosion. No trace of the roof remained, and fill consisted merely of a shallow layer of windblown sand over a thinly plastered mud floor. A stone sill was found in the entry at the edge of the floor. This consisted of a single piece of sandstone measuring about 48 by 30 centimeters. A rather informal basin-shaped hearth about 50 centimeters in diameter and four centimeters deep was slightly off center toward the entry. Very little cultural debris was found in the hogan and no ash heap was located. Only the floor and interior of the entry were excavated, the soil being so shallow around the structure that it concealed little but bedrock. There was not sufficient fill to separate collections by floor and fill.

The walls are probably close to original height on the west and north sides (fig. 57). The quantity of fallen rock is enough to account for the amount of missing wall, indicating little if any salvaging of rock from the structure after abandonment.

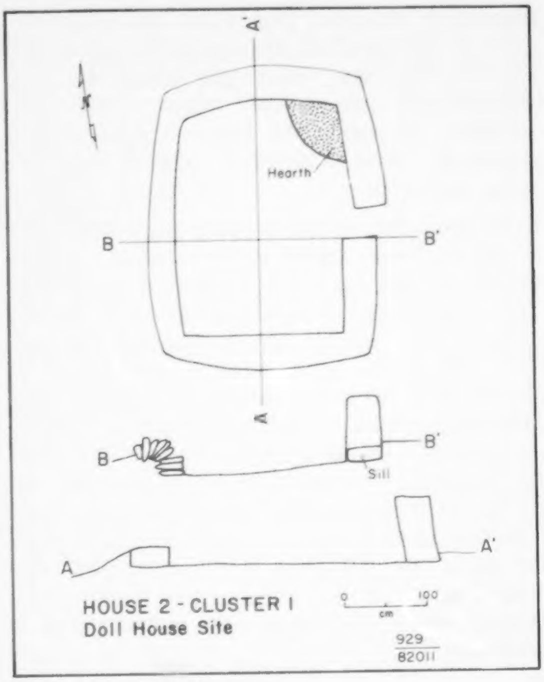
House 2 (fig. 58).

House 2 is located about 40 meters east of Hogan 1. This small house is well back from the rim and overlooks a small arroyo that passes between the two structures. It also is built on a very sparse layer of soil over the underlying bedrock, and only the interior of the structure was excavated. The floor plan is rectanguloid with bowed-out walls and sharp corners. Interior dimensions are 2.76 meters south to north by 2.12 meters east to west. The entry is oriented at 98 degrees east of magnetic north. No ash dump could be identified. The wall on the north side of the entry is offset to the east some 14 centimeters from alignment with the wall on the south. The walls lean inwardly somewhat, probably having been built in this fashion. The hearth is in the northeast corner. Too little remains of the walls to determine whether it was equipped with a smoke hood and chimney. If not, a smoke hole at least must have been provided in the roof



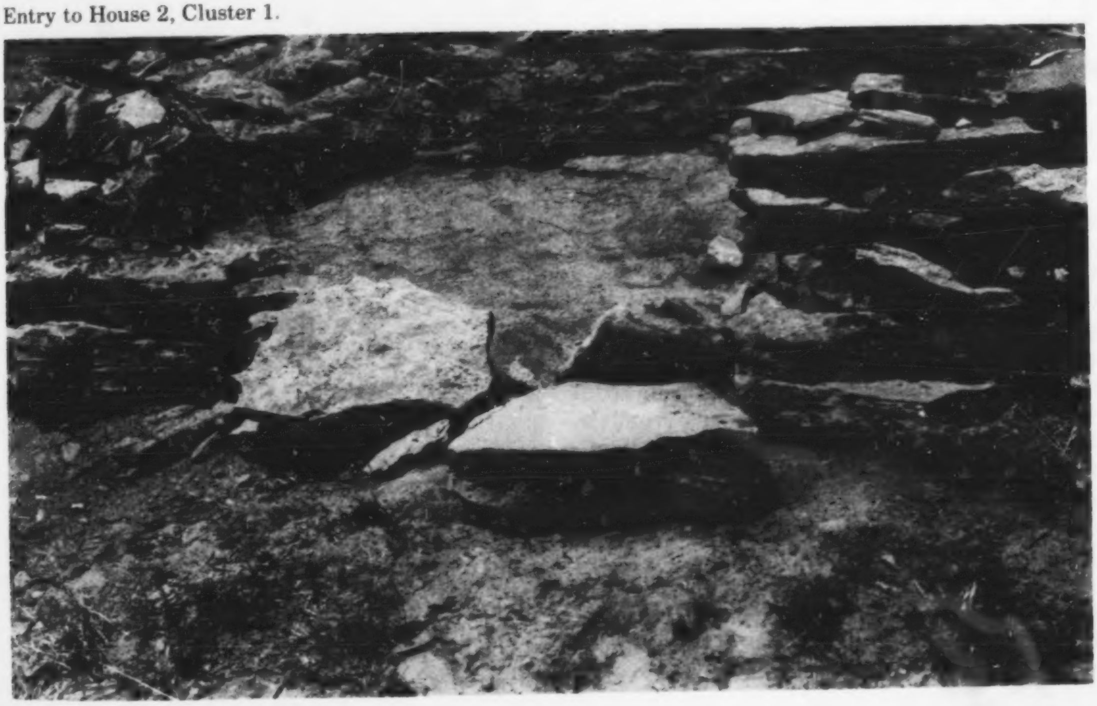
Hogan 1 after excavation.

above the hearth. No formal provision had been made for the hearth itself, there being no rim around it and only a very shallow depression such as might develop through time from cleaning out the ashes. The masonry was largely of slabs of dark sandstone. The entry was blocked with several slabs (fig. 59) which appeared too large to have been a portion of the fallen walls, suggesting purposeful obstruction. Fallen masonry in volume equals about 40 percent of the volume of the standing walls. Existing wall heights are so low, from 20 centimeters to 91 centimeters, that the probable loss should be considerably greater, at least equal to the



Map of House 2, Cluster 1.

Entry to House 2, Cluster 1.



amount in the standing walls and probably more on the order of 150 percent. It thus would appear that rock from this structure was salvaged for use in later construction. Fill consisted primarily of fallen masonry and windblown sand, with little cultural material being recovered.

A juniper splinter found under the wall debris in the southwest corner may have been a remnant of the roof, but if so, it was all that remained. This is sufficient to indicate that conditions of preservation have been such that had the roof been left on the house, greater portions of it should have survived, again indicative of the salvaging of structural materials. Thus, abandonment as a dwelling was probably deliberate and preceded abandonment of Clusters I and II in their entirety. Reuse of material suggests that abandonment was not caused by a death within the structure. Blocking of the entryway was doubtless for some other purpose, perhaps so that the remaining walls could be utilized as a lamb pen.

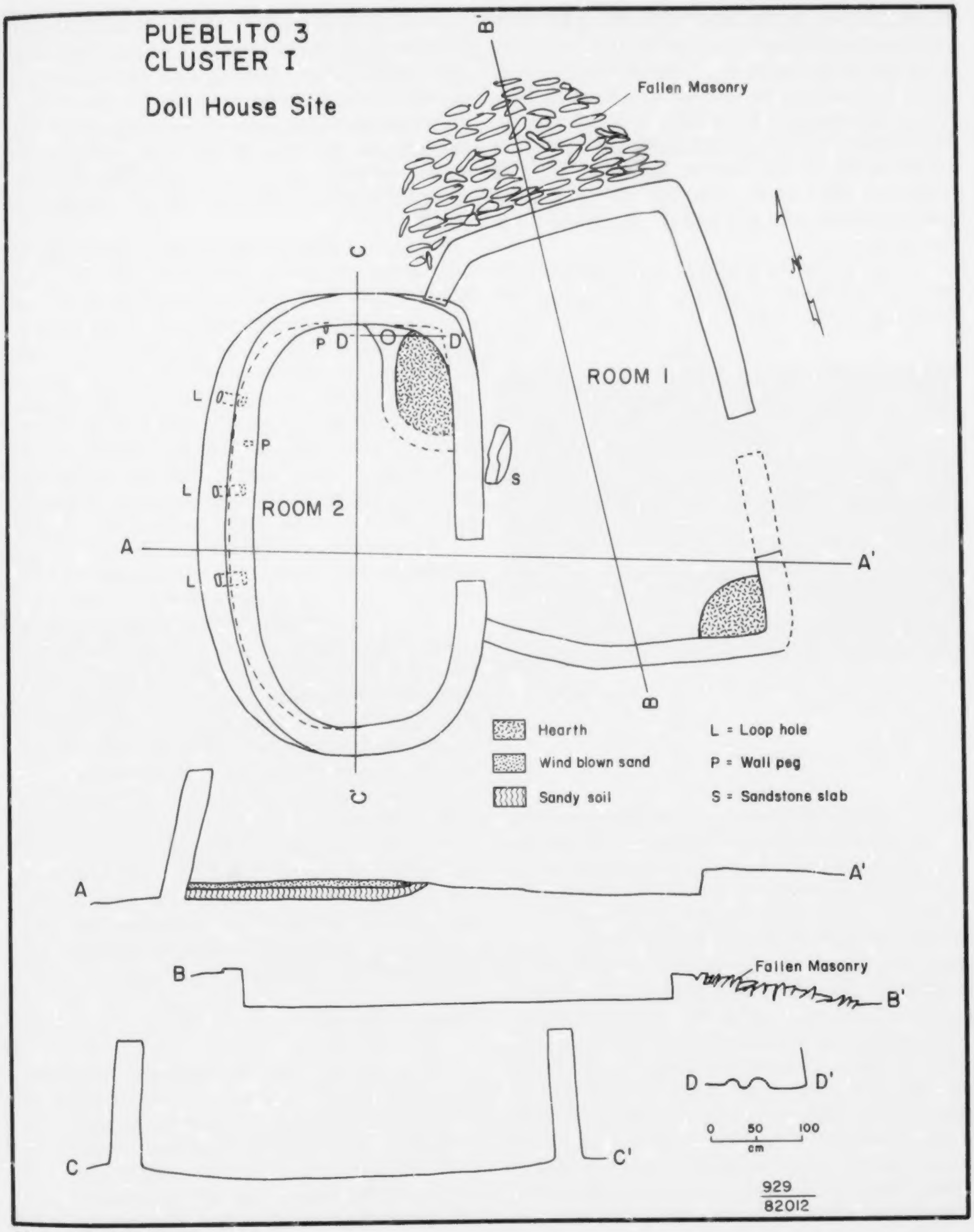
Pueblito 3 (figs. 60 and 61).

This structure, located north-northeast of House 2 and about seven meters from the rim of the bluff, has two rooms built of sandstone slabs. The first room erected was Room 2, an elongate oval chamber with the south, west and north walls leaning inward. The floor measures about 2.45 meters east to west by 4.30 meters south to north. The entry orientation is 105.5 degrees. It had an adobe floor. A well prepared hearth (fig. 62) in the northeast corner had an adobe rim about four centimeters high and 14 centimeters wide, flaring near its junction with the north wall to provide a place for a shallow hole that probably served as a pot rest. The hole is about 16 centimeters in diameter and seven centimeters deep. The hearth itself is a basin about eight centimeters deep as measured from the top of the rim, although only about 2.5 centimeters below floor level. There are no certain remains of a smoke hood, but the peg in the north wall might be the stub of a support for a hood. There are three loopholes (fig. 63) in the west wall, measuring 10 centimeters by 12 centimeters, 10 centimeters by 10 centimeters, and 12 centimeters by 15 centimeters. Two additional small wooden pegs (fig. 64) were inserted in

Pueblito 3 after excavation.

Hearth in Room 2, Cluster 1.

Loop holes in west wall of Room 2, Pueblito 3.


PUEBLITO 3
CLUSTER I
Doll House Site
B'
Fallen Masonry
N
C
P D
D'
ROOM 1
L
P
S
L
ROOM 2
A
A'
L
B
C'
Hearth
Wind blown sand
Sandy soil
L = Loop hole
P = Wall peg
S = Sandstone slab
A
A'
B
Fallen Masonry
B'
D
D'
0
50
100
cm
C
C'
929
82012

Map of Pueblito 3, Cluster 1.

the walls, one in the west wall about halfway between the two northernmost loopholes and the other about the center of the north wall. Heights of the loopholes above the floor are, from south to north, .95 meters, .95 meters and .72 meters. The peg in the west wall, of cholla, is 1.18 meters above the floor and that on the north wall, of juniper, is .88 meters high. The west peg is 1.5 centimeters in diameter and the north one three centimeters.

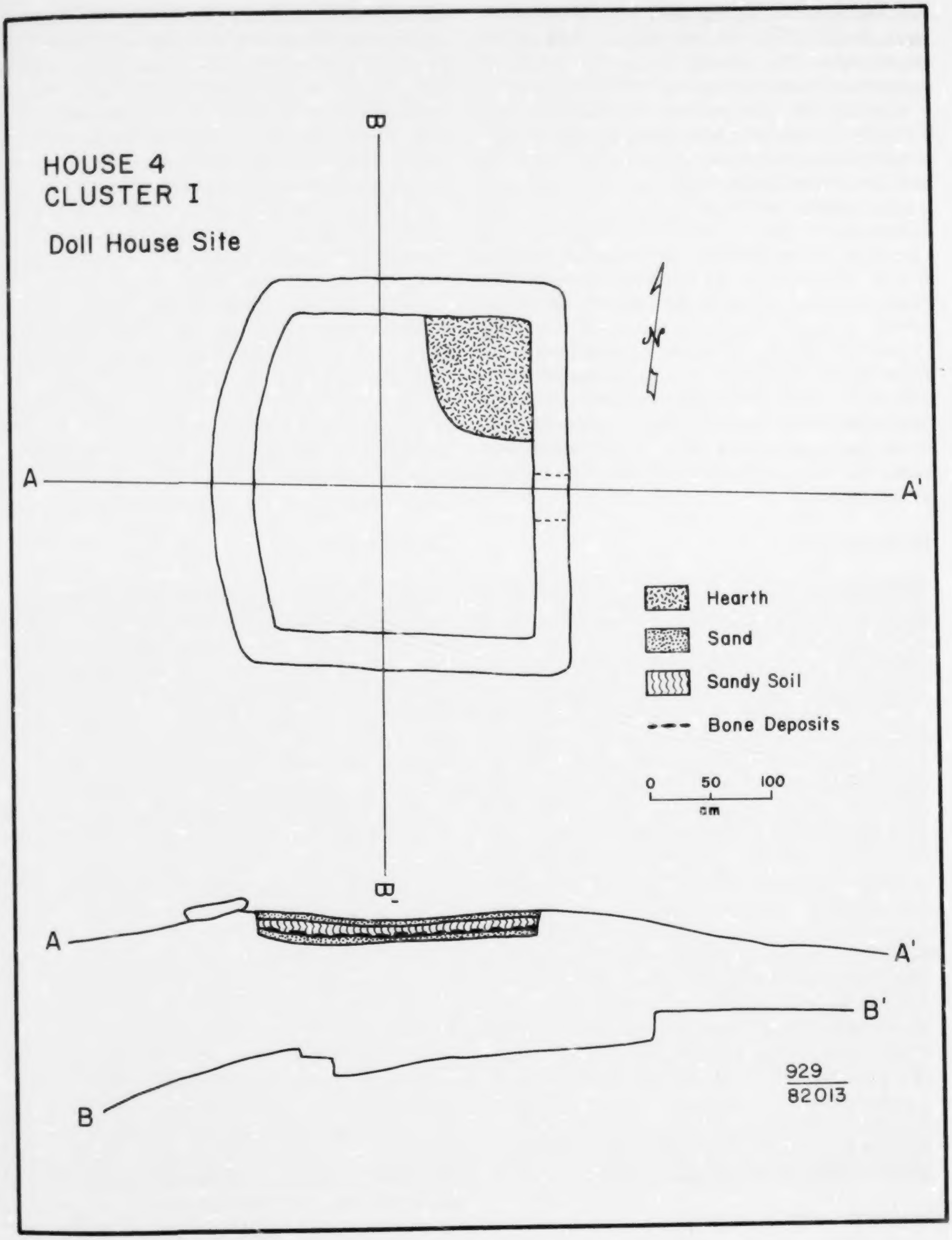
Room 1 has walls that abut the exteriors of the walls of Room 2. How long after the construction of the first room this was added is impossible to determine, but the less symmetrical layout of the room and thinner walls suggest a time lapse of some magnitude, probably on the order of a few years at least. The remaining walls are much lower, but no significant difference in the masonry style, aside from wall thickness, was noted. The north wall has fallen outwardly in one piece, the stones still lying in somewhat the same relative positions that they occupied in the structure. Thus, although the entry to Room 2 opens into Room 1, it probably opened originally to the exterior. The ground plan of Room 1 is somewhat rectanguloid with distinct corners. The floor measures about 5.5 meters south to north and 3.0 meters east to west. There is a hearth in the southeast corner which was, when excavated, so filled with accumulated white ash as to be heaped above floor level to a height of about 11 centimeters. The hearth lacked any formal rim and measured about 70 centimeters east to west by 60 centimeters north to south. The floor was plastered, but over most of the area had not survived well. It was particularly distinct where it sloped up to the sill of the doorway between the two rooms. The north side of the entry from the exterior was present, but the wall on the south side was no longer present, making it impossible to determine its width. Orientation is very nearly due east.

Stub of peg in north wall of Room 2, Pueblito 3.

Cultural debris was sparse in both rooms, consisting primarily of a few sherds, glass beads, flakes and a moderate quantity of bone and charcoal. A concentration of minor trash to the northeast of the entry near the rim of the bluff may indicate the former presence of an ash heap in that location, but if so, the deposit has been eroded except for the few heavier items. The only piece of metal that may date from the 18th-century occupation was found on the surface near the pueblito, a portion of a link from a small chain such as might be used for a bridle bit. All roof timbers had been removed from the structure, but there does not appear to have been any substantial salvaging of masonry for use elsewhere. A large slab of sandstone in Room 1 leans against the wall about one-half meter north of the entry to Room 2 (fig. 61). It is too large to have been part of the walls and may have been used to help close the doorway. If large slabs were routinely used for this purpose, the presence of similar rocks in entries at other structures cannot be assumed to indicate a ch'indi structure without other evidence to support this conclusion. An obstruction of this sort would be impractical for frequent opening and closing but might have been used during periods while the family was at other locations or had lambs, puppies or other creatures that they wished to restrain in some way.

House 4 (fig. 65).

This was a small rectanguloid structure built of sandstone slabs, but quite thoroughly dismantled, much of the masonry having been salvaged for use in other structures. Remaining walls averaged about 20 centimeters high and the remaining loose stones are not sufficient to add more than another few centimeters (fig. 66). The front wall faces about 82.5 degrees, but the entry was only tentatively identifiable in this wall and has an estimated width of about 75 centimeters. The floor plan is rectanguloid with


HOUSE 4
CLUSTER I
Doll House Site
B
N
A
A'
Hearth
Sand
Sandy Soil
Bone Deposits
0
50
100
cm
B
A
A'
B'
B
929
82013

Map of House 4, Cluster 1.

the west wall bowed outward. Floor dimensions are about 2.20 meters east-west by 2.95 meters south-north. The hearth is in the northeast corner and lacks any special provisions such as rim or pit. Ash, charcoal and heat-reddened soil indicated a size of about 69 centimeters east-west by 99 centimeters north-south. Shallow fill and the eroded surface with bedrock exposed in many places made excavation outside the structure of little value and digging was restricted to the interior. Again, little cultural debris was recovered and most of this was above floor level. A sandy layer covered the floor, which was quite clean. On the top of the sandy layer was a deposit of bones, most appearing to have been dietary refuse but also including an awl, the only such artifact recovered at the site. Above the bone layer was a sandy soil containing some fine gravel and above this, windblown sand. No ash heap could be identified for this structure.

Rockshelter 5.

Feature 5 is a small natural rockshelter about 60 meters south of Pueblito 3. It measures about three meters long, .6 meters high and 1.2 meters deep. A rough stone wall about 25 centimeters high is built of sandstone slabs across the front. It was not tested. It may have functioned as a storage bin or as a lamb pen.

Check Dam 6.

This is one of several small check dams noted in the site area. Most were not assigned structure numbers. They are built of rocks laid on a foundation of ax-cut branches and cross the various small drainages. All are within the Park boundary, suggesting that they postdate the Park Service boundary survey. There can be little doubt that they were one of the many Civilian Conservation Corps projects accomplished during Depression days. Most are still functional and retain soil on their upper sides. Whether they were built by Navajo labor was not ascertained, but the few Navajos asked could tell us nothing of their history, and it is more likely that white or Sioux workers put them in place.

House 7.

This is an elongate house some 200 meters east of Pueblito 3. It is a part of Cluster II. It was constructed of sandstone slabs and blocks but quite well collapsed. The main room which probably served as a dwelling might be oval or rectanguloid and measures an estimated 2.5 meters east-west by 3.7 meters south-north. A small room appended to the south end is about 1.5 meters square. Its small size suggestes that it was merely a storage chamber. The north wall appears to have been broken out and the entry blocked with slabs, suggestive of a structure abandoned due to death.

Only the ash heap, which was about 5.7 meters northeast of the structure, was excavated. A fair quantity of bone and sherds was recovered, along with one of the few projectile points found and charcoal, flakes, and concretions. Concretions are so plentiful on the site naturally, however, that no cultural significance can be inferred from their presence.

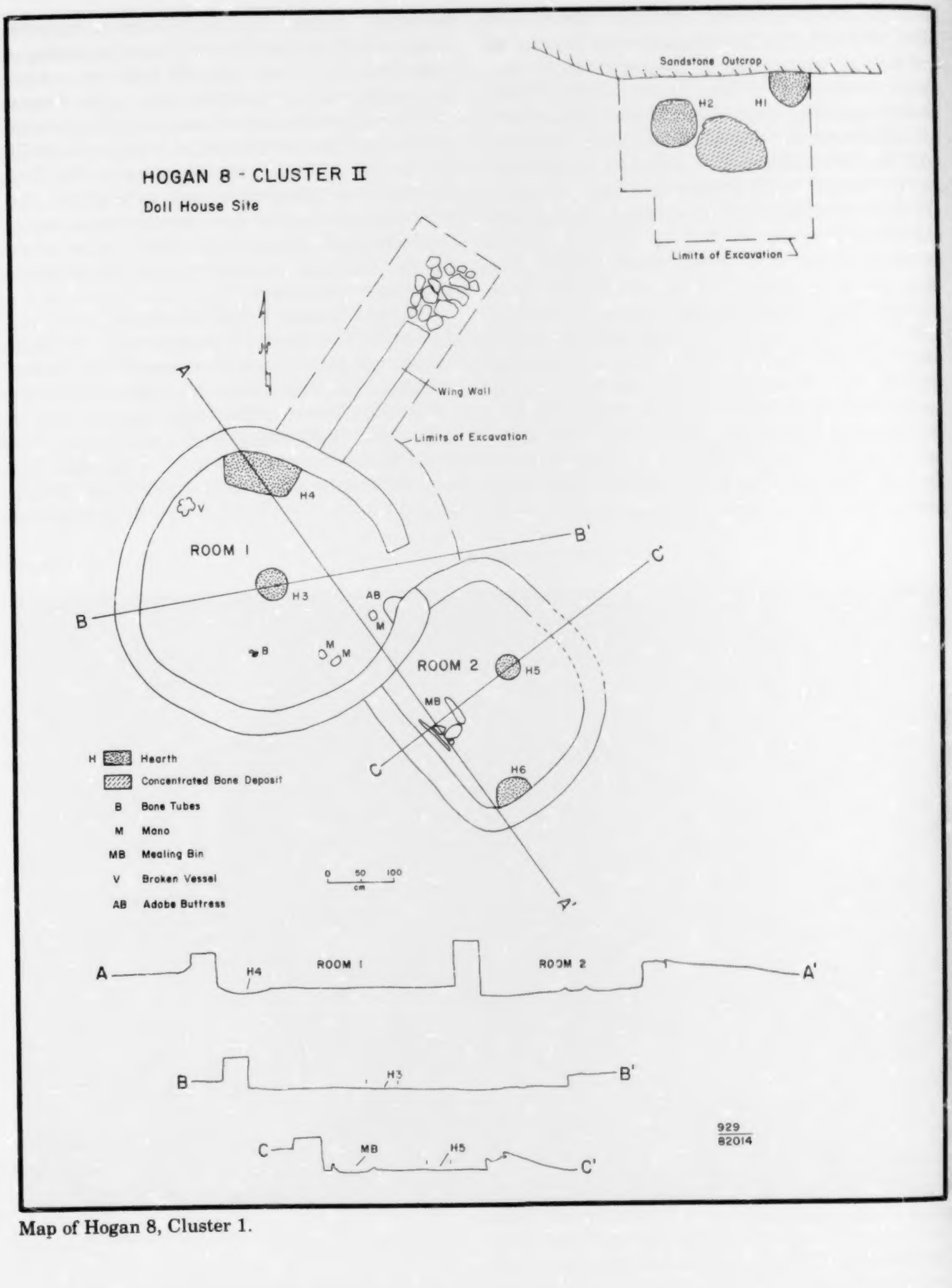
Hogan 8 (fig. 67).

This is a double hogan located about 70 meters northeast of House 7 in a small saddle between the northeast point of the bluff and the main part of the site area. It is the only structure on the bluff top that is closely associated with Anasazi debris, the prehistoric trash being concentrated downslope a few feet from the entry of Room 1. Excavation was done only in areas where the probability of mixture of Anasazi materials was low, and it is believed that all items recovered are related to the Navajo occupation.

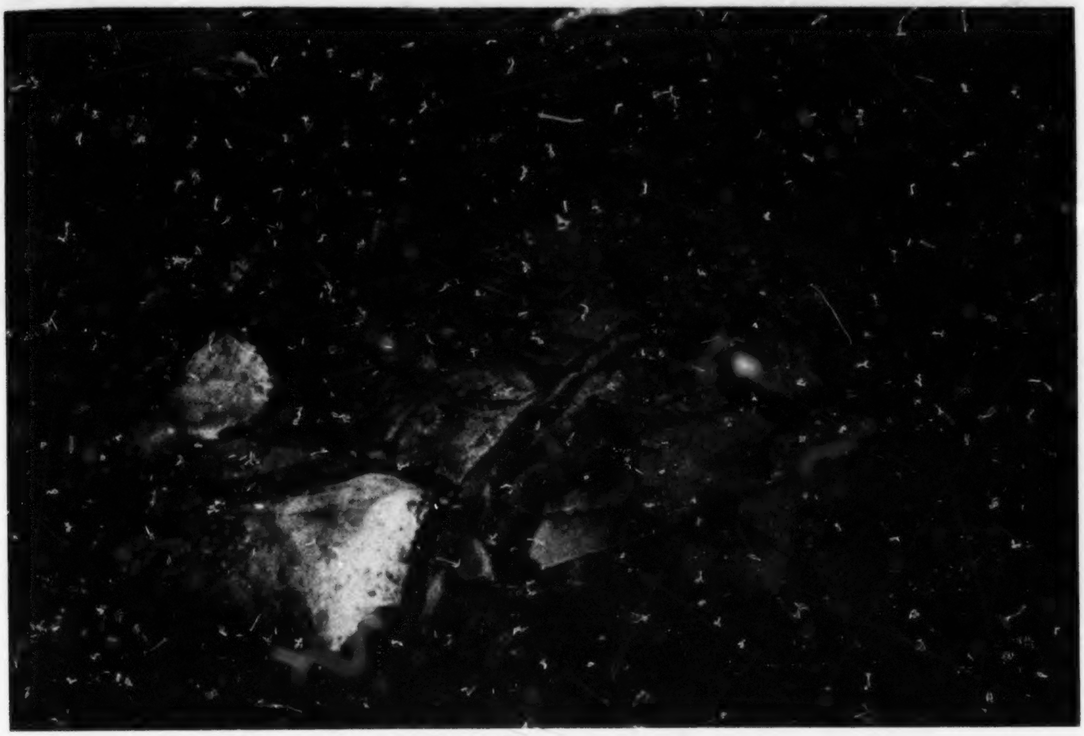
The hogan was built of sandstone slabs. Room 1 was that first constructed and is round in ground plan, although far from a perfect circle. Maximum diameter is about four meters. The entry is oriented at about 82 degrees and is about 86 centimeters wide. A small adobe mound or "buttress" on the south side of the entry is a unique feature for which no function can be suggested. The floor appears to have had an adobe plaster, but this was so poorly preserved as to be difficult to follow in excavation, and it is probable that the roof was removed, exposing the floor to the effects of weathering, shortly after the structure was abandoned. An unrimmed hearth quite near the center of the floor was clean and level, indicative of limited use or use as the first hearth, the former interpretation being perhaps the most likely. Another hearth, well filled with ash, was found against the north wall and was obviously that in the use at the time of abandonment. This also lacks a rim, being merely a shallow depression. The central hearth has a diameter of about 46 centimeters, while the wall hearth measures 126 centimeters in length along the wall by 60 centimeters wide. As with all wall hearths, use of a smoke hood and chimney is probable, but no trace of these remains. While the central hearth might have been the first used in the structure, another interpretation would fit modern Navajo practice somewhat. This is that the wall hearth was the regularly used facility for heating and cooking throughout the occupancy, while the central hearth was used when ceremonies were held in the hogan. There is a possibility that there were two superimposed floors in the hogan, so that the first alternative cannot be ignored, but it was never possible to define a second floor with certainty. There was considerable material recovered from the fill and floor, including a large quantity of bone (fig. 68) believed to be of post-occupational deposition, a few glass beads, a projectile point, some manos, a broken vessel and a set of four bone tubes, one found in the fill and the other three lying together on the floor (fig. 69) in an arrangement suggesting that they had been attached to some perishable backing. The loose tube had probably been a part of the set and displaced by subsequent disturbance, perhaps by rodents.

Room 2 was built against the southeast side of Room 1. The front was rounded and the back wall almost straight. It also was constructed of sandstone slabs, the front wall being so poorly preserved, however, the exact location of the entry was not possible to ascertain, but orientation was northeasterly. This chamber also had two hearths, one somewhat off center toward the front wall and the other against the

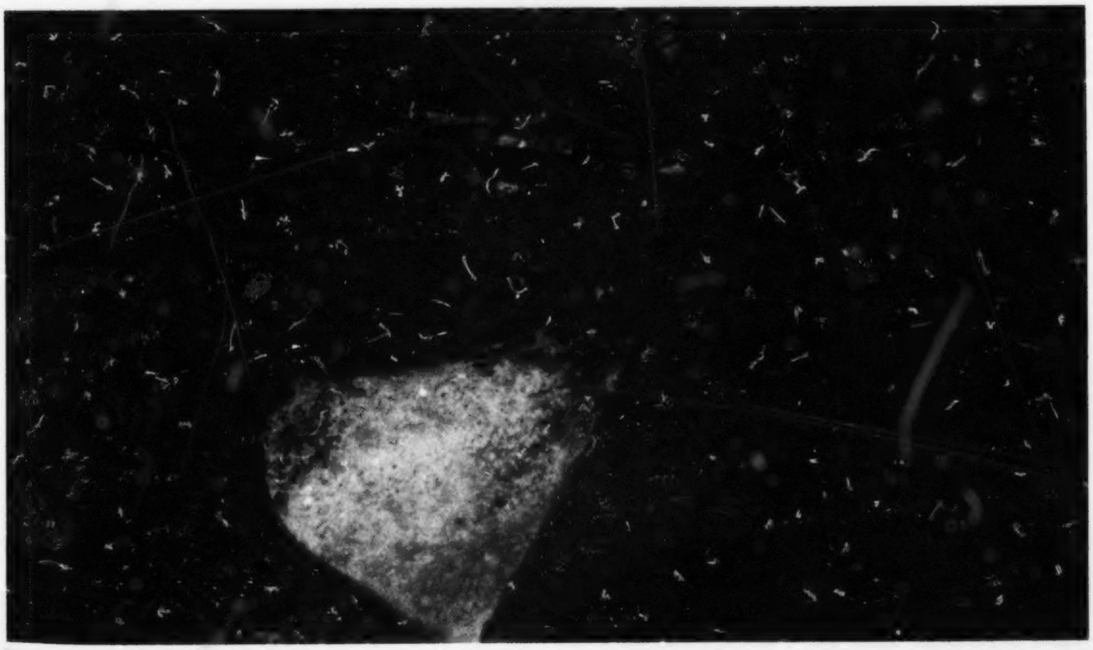
House 4 after excavation.


HOGAN 8 - CLUSTER II
Doll House Site
Sandstone Outcrop
H2
H1
Limits of Excavation
Wing Wall
Limits of Excavation
A
A'
B
B'
C
C'
H4
V
ROOM 1
H3
AB
M
M
M
B
ROOM 2
H5
MB
H6
H Hearth
Concentrated Bone Deposit
B Bone Tubes
M Mano
MB Mealing Bin
V Broken Vessel
AB Adobe Buttress
0 50 100
cm
H4
ROOM 1
ROOM 2
H3
MB
H5
929
82014

Map of Hogan 8, Cluster 1.



Bone deposit on floor of Room 1, Hogan 8, Cluster II.



Bone tubes in Room 1, Hogan 8.

Mealing bin, Room 2.

wall near the south corner. Again, the central hearth was relatively small, about 38 centimeters in diameter, and clean, while that against the wall was larger, 57 centimeters long and 55 centimeters wide, and filled with ash. Another feature of this room is a mealing bin (fig. 70) near the rear wall. This was built of sandstone slabs and adobe with a hard smooth rock in the floor at the southeast where the ground meal would be collected. The metate and some of the slabs supporting it had been removed, probably at the time of abandonment, so that only one end remained intact. A broken utility vessel was found where the entry may have been.

Evidence of use of the exterior space near the hogan was abundant. No ash heap was defined and it is not unlikely that this was so mixed in with the Anasazi trash area as to be effectively obscured by it during subsequent erosion. A wing wall (fig. 71) about 3.13 meters long abuts the northeast wall of Room 1 and extends to the northeast, providing shelter for a yard area that must have been quite exposed otherwise during windy weather. Beyond this and near a low southfacing ledge, testing revealed two informal hearths and a sizeable deposit of bone. The hearths measured about 50 centimeters by 60 centimeters and 70 centimeters in diameter, the former being against the sandstone ledge which was heat-reddened at that point. The materials were in a deposit of windblown sand and were entirely Navajo insofar as it is possible to determine, the Anasasi trash being some five meters to the south. The bones were most concentrated in an area about one meter in diameter just south of the open hearth, but there were some bones throughout the entire area tested.

The quantity of fallen rock does not appear sufficient to account for the walls as they must have been built originally. It is possible that some rocks as well as the roofing timbers were salvaged for use in later construction, probably at House 9.

Structure 22.

A low-walled rock shelter northeast of Hogan 8, is close enough that some association might be expected. It appears, however, to have

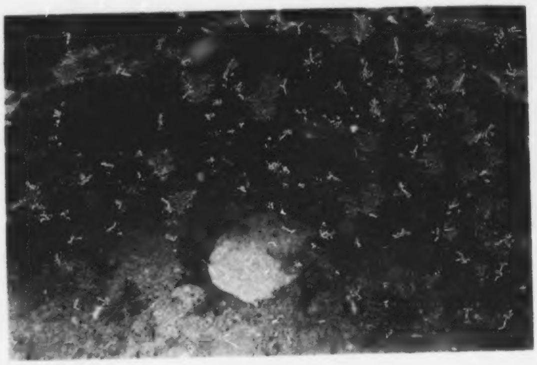
Wing wall at Hogan 8.

had use as a recent sheepherder's camp site and is not thought to be a part of the 18th-century component.

House 9 (fig. 72).

Located about 65 meters north northeast from Hogan 8 on the elevated northeastern point of the bluff, this is a single-room structure built of sandstone slabs. The floor plan is rectanguloid with definite corners, but bulging walls lean inwardly, particularly in the rear part of the room, so that at a short distance above ground level, the shape of the structure is more ovoid. The floor measures about 2.5 meters front to rear by 3 meters side to side. The entry is oriented about 33 degrees east of north and is provided with a vestibule (fig. 73) that extends about 88 centimeters out from the front wall. The ends of the vestibule walls curve northward, shifting the entry orientation somewhat more toward the north. There is a loophole in the southwest corner about 70 centimeters above floor level. It measures about 25 centimeters wide by 12 centimeters high. The only hearth (fig. 74) is in the northwest corner. Two slabs, one across the corner at the rear of the hearth and another set into the floor in front of it, seem to have been installed as a part of the hearth, but no rim exists, nor is there any trace of a smoke hood. The hearth measured about 92 centimeters along each wall. Despite very shallow fill, an exterior area measuring 5 meters by 10 meters in front of the house was cleared as well as a 1 meter area about the exteriors of the walls. A slight ash lens was found almost directly out from the entry and a little more than three meters from the outer end of the vestibule. This was probably the ash heap but if so, the use of the building was very limited or most of the heap has been eroded. A small deposit of charcoal northwest of the vestibule could not be identified as a hearth and was probably an accidental deposit of some sort. Very little cultural debris was found in association with this structure. This is one of the better preserved structures on the bluff, the walls standing up to one meter high in part. The fallen stones are sufficient to account for all loss from the walls.

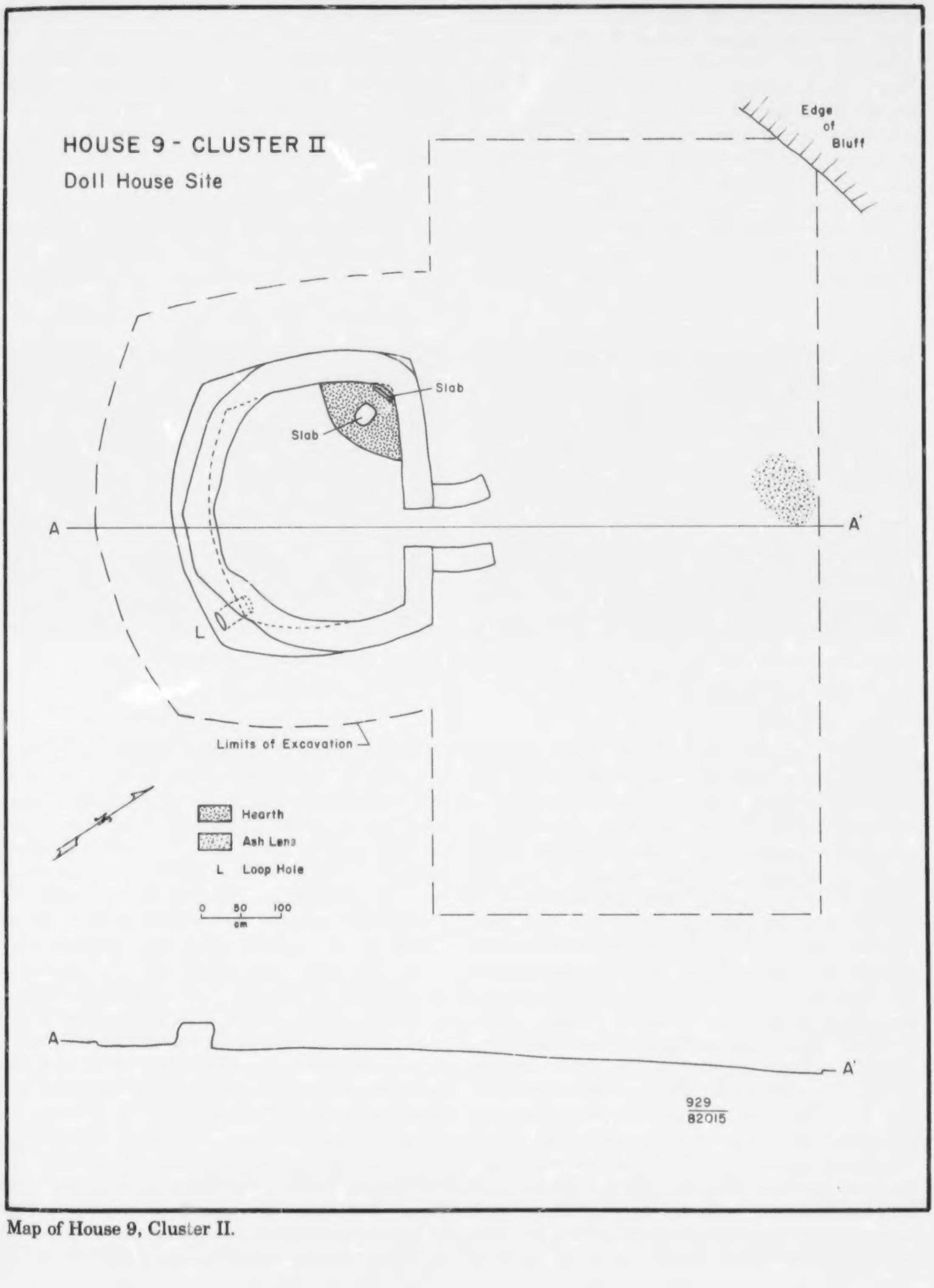
Vestibule entry of Hogan 9.


Corner hearth.

The anomalous orientation and very exposed location of this structure suggest a special use, perhaps as a defensive location to guard the head of a steep trail that ascends the bluff at this point and as a lookout for observation of the canyon. Navajo tradition indicates ritual use association with hunting and warfare (see below).

Hogan 10 (fig. 75).

This structure is situated on the rise southeast of Hogan 8. It is a double hogan built of sandstone slabs and is another of the more ruined structures on the site. Walls abutments reveal that Room 2 (fig. 76) was built first. This is a seven-sided polygonal hogan which almost certainly had a cribbed-log roof. It has a diameter of about three meters. The entry is

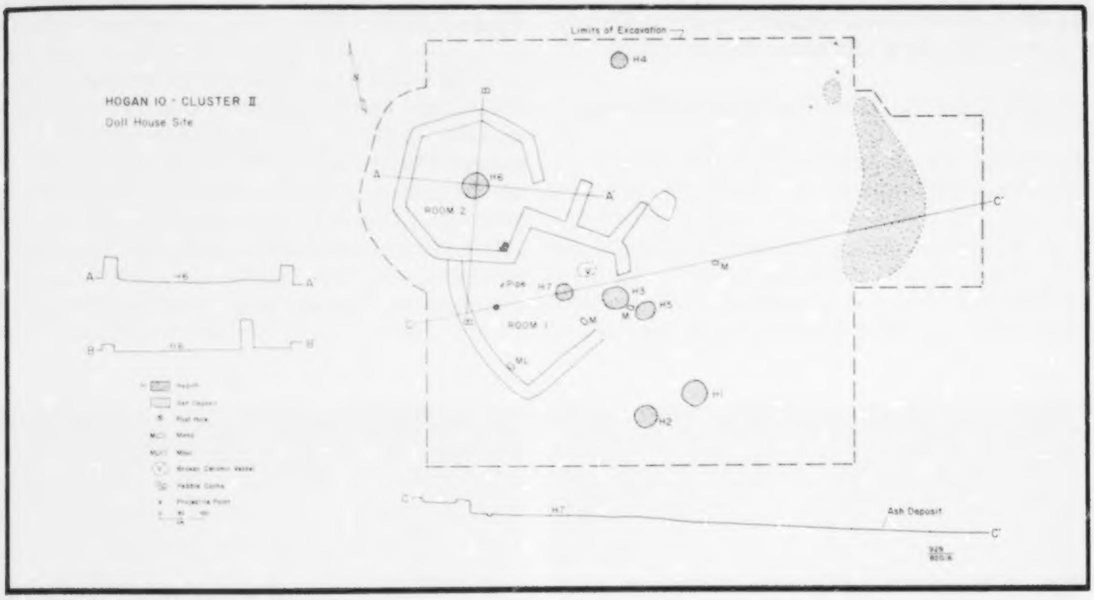

HOUSE 9 - CLUSTER II
Doll House Site
Edge of Bluff
Slab
Slab
A
A'
L
Limits of Excavation
Hearth
Ash Lens
L Loop Hole
0 50 100
cm
A
A'
929
82015

Map of House 9, Cluster II.

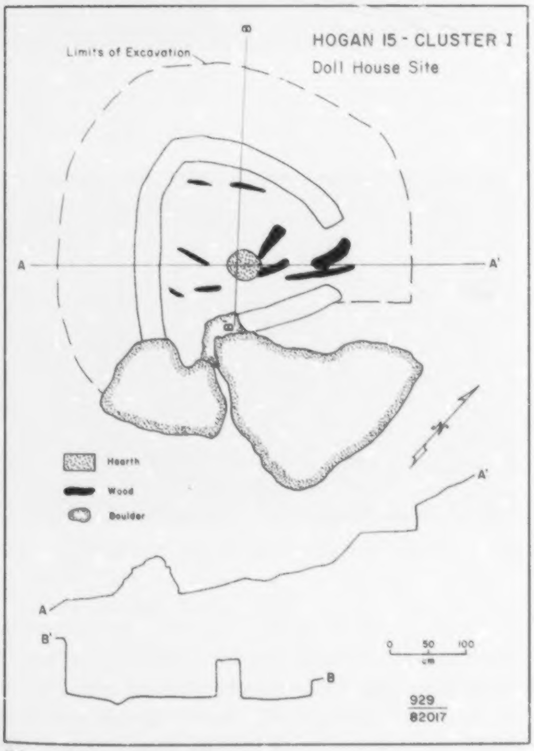
oriented at about 109 degrees. The hearth is very near the center of the floor and is an informal area lacking rim or prepared pit. Room 1 was added to the southeast side. It is rather irregular in floor plan. The north wall extends outward from the south side of the entry to Room 2 and bends to form the northern portion of the east wall. The remainder of the east wall and south and west walls were very poorly preserved and difficult to define, but seem to have outlined a very roughly trianguloid area indented at the apex of the southeast corner of Room 2. A short wall that extends northwesterly from the north wall of Room 1 shelters the entry of Room 2 (fig. 77) as a sort of exterior curtain wall, perhaps intended to exclude the early morning down-canyon drafts that are common in the summer. A second addition to the north wall connects it to a boulder near the hogan and may have once been paired with a similar wall also abutting the boulder to form a bin or lamb pen just north of the entry to Room 2. The entry of Room 1 opens somewhat south of east, but poor preservation of the walls makes the exact orientation uncertain. A posthole near the rear center, a very shallow pit cut into bedrock, does not give sufficient depth to support a free standing post and suggests rather a prop put in place after a roof had been installed. An informal hearth located front-center was used for the structure while inhabited. Another hearth, directly in the entry, suggests postabandonment use as a camp after the roof had been removed. Still another informal hearth was found a very short distance southeast of this, it also being so close to the entry as to suggest that it postdates use as a permanent habitation. Three other exterior hearths were noted, one northeast of the entry to Room 2 and two southeasterly from the entry of Room 1. These also are informal hearths created by merely building a fire on the surface at the time. They may well date from either the period of habitation in the hogan or later. The ash heap was found about five meters east of the entry to Room 2 and extends in an arc northward, possibly spread by erosional forces or perhaps a merging of what were originally two separate ash heaps for the two rooms. A small ash deposit was immediately northwest of the northern end of the ash heap. The proximity of three projectile points to this feature is interesting, but of uncertain significance. A cache of waterworn pebbles was found in a corner of Room 2, and several similar pebbles were uncovered from the ash heap. Most artifacts that seemed to be on the floor came from Room 1, however, where a mano, a maul, a ceramic pipe and part of a restorable vessel were found. A mano and some piki stone fragments near the entry are of undetermined association, perhaps relating to the hearth. A few glass beads were found near the entry of Room 2. There was sufficient fallen masonry to easily account for full height walls at Room 2, but the quantity at Room 1 is less than might be expected. This might be a result of the salvaging of stones for later use, but the walls of Room 1 were generally

Hogan 10 after excavation.

Wall sheltering entry of Room 1.


HOGAN 10 - CLUSTER II
Doll House Site
Limits of Excavation
N
B
A
A'
H6
ROOM 2
ROOM 1
H4
H7
H3
H5
H1
H2
Pipe
M
ML
C
C'
Ash Deposit
Hearth
Ash Deposit
Post Hole
Broken Ceramic Vessel
Projectile Point
929
82018

Map of Hogan 10, Cluster II.


HOGAN 15 - CLUSTER I
Doll House Site
Limits of Excavation
B
A
A'
B'
Hearth
Wood
Boulder
0 50 100
cm
929
82017

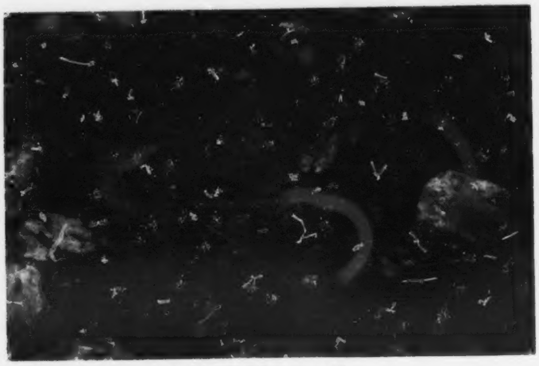
Map of Hogan 15, Cluster 1.

of smaller rocks, making stacking and estimation of total volume a less accurate procedure.

Check Dam 11 (See Check Dam 6 above).

Pothole 12.

A shallow natural pothole on top of the outcrop south of Cluster 2 has some associated pieces of heat-reddened sandstone. It is probable that this depression was utilized in the melting of snow for domestic or stock water, but a hearth used for heating the stones could not be defined.



Charred logs on floor of Hogan 15.

Cairn 13.

A rock cairn in Cluster III near Hogan 19 is of undetermined function.

Hogan 14.

This hogan is located on a small bench on the talus below Hogan 10. It is also a stone hogan built of sandstone slabs. Excavations were limited to testing in the southeast quadrant sufficiently to ascertain that the floor had been leveled by digging into the slope on the uphill side and that there was a hearth in a front-center position. No artifacts were recovered here, but a mano and a broken metate on the surface were photographed. The entry is oriented easterly and the ground plan is apparently circular.

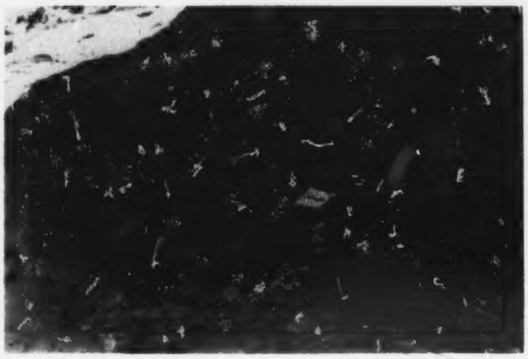
Hogan 15 (fig. 78).

This southernmost dwelling in Cluster I is a very crude structure built of sandstone blocks and slabs against a low ledge, the walls being of coarser masonry than that of the other hogans or of the houses and pueblito. The floor plan is roughly trianguloid, measuring about 2.2 meters from front to rear and 2.4 meters across the back wall. The hearth is centrally located. The floor is quite uneven and slopes downward from the entry, there having been effort made to level it well. This may not have been a dwelling at all, but merely a camp structure of some sort that had very temporary occupation. It is the only structure in which remnants of roofing timbers (fig. 79) were found. The wood was badly decayed and most pieces lay with a

Articulated bone.

Hogan 17, Cluster III.

front to rear orientation, the tips being toward the rear in those instances where this could be determined. One piece of wood which was least aligned with the others had one end in the hearth and was charred on this end. It, apparently, was merely a length of firewood which had been incompletely consumed by the last fire. The entry orientation is about 47.5 degrees. Aside from a mano and a very few sherds, the only material uncovered consisted of a large quantity of bone (fig. 80). No ash heap was identified.



Hogan 18, Cluster III.

Hogan 16.

This is an easterly facing rock shelter in Cluster III with a few rocks around the front suggesting use for a shelter or dwelling. On the ceiling are five x's roughly drawn with charcoal, a custom sometimes observed by Navajos when camping in the shelter of an overhang as a prayer that the rock not collapse. At this particular shelter, the overhead rock extends outwardly from the bedrock ledge in such a way as to appear quite precariously situated which may explain the use of this ritual here but not in other rock shelters which were occupied on the site.

Hogan 17 (fig. 81).

This D-shaped hogan is built of sandstone blocks and slabs in dry-laid masonry against an easterly-facing ledge in Cluster III. Two small storage rooms are adjacent to it under the ledge on the north side. No definite ash heap was identified, but a few very small sherds were found on the surface to the east of the structure.

Hogan 18 (fig. 82).

Also in Cluster III, but well north northwest of Hogan 16 and 17 and on a higher level above the rim of the canyon are the remains of a low wall or foundation for a D-shaped structure built against a ledge under an overhang. Virtually no fill is retained over the bedrock floor, nor could any ash or trash be located.

Granary 20, Cluster II.

Hogan 19.

A fourth structure very similar to Hogan 18 is located south of it. Both are in easterly-facing rock shelters.

Granary 20 (fig. 83).

In the cliff below Hogan 10 is a well-concealed rock shelter in front of which is a small level area. The shelter contains two well-built chambers of sandstone masonry set in adobe mortar. The masonry style is very similar to that of the dwellings in Clusters I and II. Associated materials were limited to corn cobs.

Granary 21.

Another granary is included in Cluster III and is also well hidden, being in a rock shelter above the floor of a small box canyon between Hogans 18 and 19.

Twentieth century stone hogan.

Structure 22.

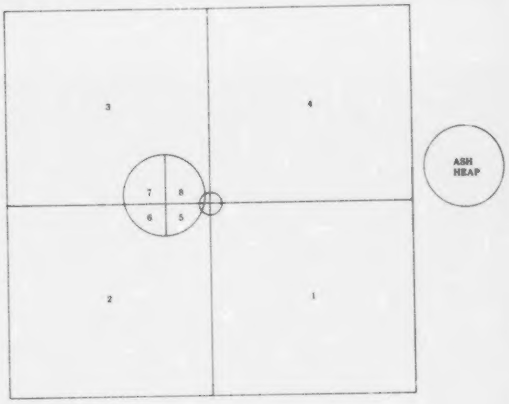
A small D-shaped structure built against a south-facing ledge near Hogan 8 is within Cluster II, but appears much more recent. The presence of a tin can at Hogan 10 and some broken glass between Structure 22 and Hogan 10 suggests that this is a very modern feature, probably the temporary camping place of a sheep herder or even more transient passerby. within the past decades.

Trail 23.

A trail that leads from Cluster III through a natural crevice in the cliff and down the talus slope would be the most direct route from this portion of the site to any fields in the side canyon to the east or to the defensive retreat at 29 SJ 1646. It shows indications of having had at least some slight work to improve it in the past, but whether this dates back to the period of occupancy of the site or is more recent work, perhaps by one of the Civilian Conservation Corps crews that did so much work in the area in the 1930's, is very uncertain. One branch of the lower portion of the trail leads to Cluster IV and the crevice undoubtedly served as a route to take sheep to the mesa top for grazing while the Mescalitos lived there.

Hogan 24 (fig. 84).

This is a large modern hogan in Cluster IV and is relatively well preserved except that the roof has been removed. It is built of shaped sandstone blocks, the wall standing about five feet high. The ground plan is circular with a diameter of about 20 feet. The ash heap is about 67 feet northeast of the entry. Trash on the site includes rubber, glass, tin cans, enameled metal containers and wagon parts. This is the hogan built by Rafael Mescalito about 1927 for his family. It was a summer camp and the Mescalitos farmed here until about 1936, herding their sheep in the area and making some continued use of the site into the 1940's. The winter camps were on Chacra Mesa.



Typical layout of quadrants for provenience control in hogan excavations.

Hogan 25.

A poorly preserved hogan close to the bluff is also a part of this cluster and probably was occupied by the same family at a slightly earlier time.

Corral 26.

A stone corral built on the talus against the base of the bluff is also included in this cluster.

Corral 27.

A second stone corral is the southernmost major feature in Cluster IV. It is close to the base of the talus and three large boulders are incorporated into the walls.

In addition, Cluster IV includes seven or more small enclosures that probably served as lamb pens and some simple rock art. These were not given structure numbers, but their presence is worth noting. All are among the talus boulders.

Structure 28.

This feature is a minature cliff dwelling built of small sandstone spalls. It was built in the late 1940's by Charlie Atencio, a son-in-law of Katherine Mescalito, while herding sheep in the vicinity. Atencio has worked for the National Park Service in ruins stabilization both at Chaco Canyon and in other National Park areas in the Southwest. He claims to have also constructed a similar model Anasazi house at Wupatki National Monument. Albert W. Ward has recently reported another miniature Anasazi site at Canyon de Chelly National Monument, suggesting that this activity was, at least for a while, a popular pastime activity by the Navajo masons who worked on the ruins stabilization crews hired at Chaco Canyon. They are probably best regarded as three dimensional rock art.

A small horse and rider petroglyph appears on the rock face above the model house, but whether associated with Atencio's work has not been determined. The style suggests an earlier date.

Sherd Area 29.

This small sherd area was tested and produced several sherds, but no structural remains could be identified.

Artifacts

The quantity of artifactual material recovered was sparse relative to that usually found in Anasazi sites. The shallow fill and lack of clear stratigraphic layers in the excavated structures were such that significant stratigraphic data were not normally determinable with regard to artifacts. Most were divided between "fill," "fill near floor," and "floor." Since the floors were generally very poorly preserved, the two latter categories are virtually synonymous. No apparent differences between fill and floor artifacts could be found, there even being cases of sherds from fill and floor contexts fitting together, so that all stratigraphic categories other than surface can be generally lumped for purposes of analysis. In most instances, the surface material can also be included with the excavated proveniences, but differences do appear that need to be noted. On the other hand, bone deposited as trash was often quite clearly the result of postoccupation disposal within the structures and produces information that is quite relevant to the interpretation of site use. Horizontal distribution was controlled by quadrants laid out with relation to the dwelling entry (fig. 85), Quads 1 through 4 being exterior five meter square areas around the hogans, Quads 5 through 8 being the interior floor quadrants of the dwelling or of the room numbered 1 if two rooms were present, and Quads 9 through 12 the floor quadrants of any in Room 2. In each series, the quadrants were numbered in clockwise sequence beginning on the southeast or what would have been the southeast if the entry had been oriented due east. The weak link in this procedure was the identification of the entry in an unexcavated structure. Only one serious error of this sort was made where the wing wall, and a probable lamb pen wall abutting the north side of Room 1 at Hogan 10 were mistakenly assumed to be the walls of a vestibule, throwing the interior quadrant off by about 70 degrees. Compensation for this was made in analysis by

TABLE 9 Doll House Sites, Ceramic Distributions

Structure #	-	1	2		3						7			8																		9		10											11	15		17	18	24	29
Quad #	-	5	7		-	-	3	7	10	11	-	**		-	4	*	5		7		8			9				10	11		12	-	1	-	1	3	**	6		7	8	9	12		-	4	5 6	**	-	-	-
Level	General Site Surface	Fill	Fill	Floor	General Surface	Ash Heap	Surface	Fill Near Floor	Fill Near Floor	Fill	General Surface	Surface	Fill	General Surface	Fill	General Surface	Fill	Floor	Fill	Floor	Fill	Fill Near Floor	Subfloor	Fill	Fill Near Floor	Floor	Hearth	Floor	Fill	Fill Near Floor	Fill	Surface Near Trail	Fill	General Surface	Fill	Fill	Fill	Fill	Floor	Fill	Fill	Fill	Upper Fill	Lower Fill	General Surface	Fill	Fill	Surface	General Surface	General Surface	Test Pit
Type																																																			
Dinetah Utility	140	1	1	2	11	28		1	1	1	34	14	42	8		1		1	2	45	1			1	12		1	1	2	11	1		5	145	1	4	3	1		2	73	1	1	4	1			1	■		110
Micaceous Var	14																																																		
Transitional Var	1				1						14			4																															1	5		1			
Navajo Utility																																																			
Governador Poly	9																														1			2																	
Navajo Painted	2			1																																															
Ogapogee Poly	1																																																		
Tewa Series	2																																																		
Santa Ana, Type Unk	1																																																		
Laguna, Type Unk						1	1								2											1																									
Acoma, Type Unk	9																																																		
Acoma, Red Rim	1																																																		
Ashiwi, Type Unk	1													1								1	1						1																					3	
Ashiwi, Black Rim	10																															1			5			28													
Kiapkwa Poly							2																																												
Hopi Black/Yellow	4																																																		
Hopi Poly, Type Unk	1																																																		
Jeddito Yellow Ware	1																																																		
Anasazi	4										3	2				2								1	2				■	4			1	9	2	1	4		1	1											1
Bottle Glass																																																		5	

*Interior. **Ash Heap. ■ — Blank, do not fill in.

using Quad 5 as Quad 8, Quad 6 as a Quad 5, Quad 7 as a Quad 6, and Quad 8 as a Quad 7. While the correspondence thus achieved is not exact, it is close enough for comparability with the other floor areas.

Relatively few of the exterior quadrants were fully excavated and the distribution in exterior space is not believed to have been sampled in such a way that artifact distributions can be considered to have been established with certainty, but the variations are such that the distributions are sufficiently indicative of activity areas that further investigations of exterior space would be desirable. The interior distributions constitute a 100 percent sample of 11 rooms and provide quite good data regarding the use of space within hogans and related rooms.

Ceramics

Sherd counts for both surface collections and excavated rooms are given in Table 9. The overwhelming predominance of Dinetah Utility clearly dates the greater part of the occupation in the 18th-century.

The sparsity of Navajo decorated types suggests a mid to late placement in the century.

It is noteworthy that the second most common category is composed of Anasazi sherds. These form a heterogeneous lot, ranging from Lino Gray through Mesa Verde Black-on-White and have no direct relationship to the Navajo occupation. Some are undoubtedly intrusive into Navajo contexts as a result of erosion, but others, from contexts such as hogan floors, seem to have been carried to their destinations by the Navajos. In some cases, this can probably be attributed to the activity of children who picked up sherds as souvenirs and playthings. Others may have been brought in for more utilitarian or even esoteric purposes, but identification of such use is not possible from the data at hand, with one exception. A hollow dipper handle of probably Pueblo II-Pueblo III origin was modified by abrasion so as to produce a straight pipe of the cloud-blower type (fig. 88b).

Zuni sherds in the Ashiwi series outnumber the Anasazi, although those clearly assignable to type are not as numerous. Only three sherds could be called Ashiwi Polychrome, while 35 were classified as Kiapkwa Polychrome, most of the latter being from one vessel. All basal sherds were red, but red rims were rare, being noted on only one sherd. Black rims were present on 21 sherds, eight of these being from a partially restorable bowl with a red base (fig. 87). If Harlow's (1937) dating of the changes in types and features is at all accurate, the majority of these Zuni sherds must come from vessels dating between 1770 and 1800, for he places the development of Kiapkwa Polychrome from Ashiwi Polychrome at about 1770. This was accompanied by the shift from a red rim to a black rim, and the shift from red to black bases is dated about 1800. Survey data presented above suggest a possible earlier date for the beginning of black rims, however.

Acoma-Laguna sherds are relatively common, 10 being assigned to the Acoma Series and six to Laguna. There is one red Acoma rim and one black Laguna rim. The use of black rims is thought to have been earliest at Acoma, around 1740 (Harlow, 1973). Distinction between Acoma and Laguna wares from the 18th century is quite difficult and my assignments by pueblo may not be accurate. Use of a sand or rock temper indicates a Laguna origin and I am inclined to give any polychrome with more than three colors a Laguna attribution, although most sources call these Acoma.

A few sherds indicative of post-1800 occupation came from specific structures. Only Hogan 15 yielded Navajo Utility from excavations. In addition, one sherd of Navajo Utility was collected on the surface from Hogan 17 in Cluster III. Glass was collected from Hogan 24 in Cluster IV, a structure known to date in the present century, as well as from the vicinity of Structure 22 in Cluster II. The latter case is a late deposit, perhaps even indicative of non-Navajo presence during the late-19th century or the 20th century.

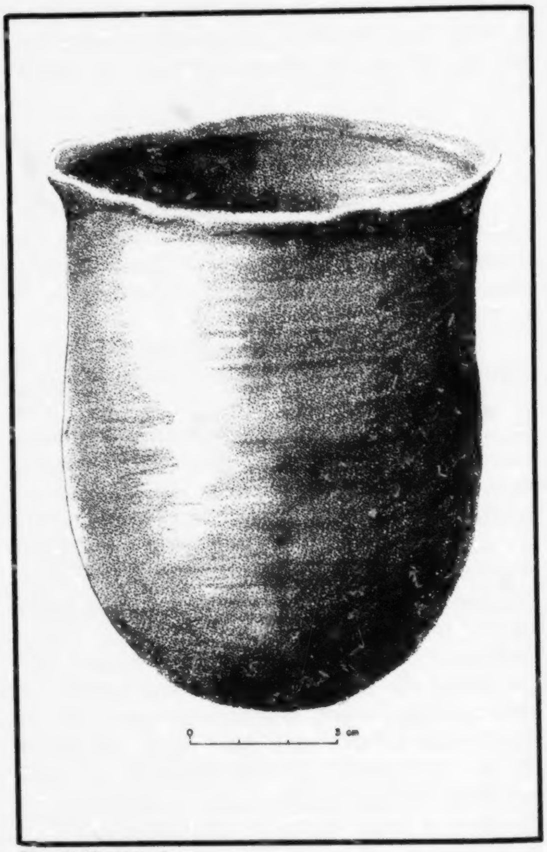
Dinetah Utility.

This type is more variable in the Chaco region than in the Largo-Gobernador country, since the majority of vessels there appear to have been medium to large jars of the distinctive shape generally called "pointed bottom." In actual fact, the bottoms are usually rather gently rounded, but are very small in proportion to total vessel size. Being at the apex of an inverted conical lower portion of the jar, the overall effect is that of a blunt "point." The center of gravity is normally low, usually below the mid-point of vessel height, much more in accord with Puebloan standards than with Plains practices. Above this, the vessel tapers inwardly to a wide neck and a slightly flaring plain rim. Small jars are sometimes of simpler outline with rounded base, straight sides and only the slightest of flare at the rim.

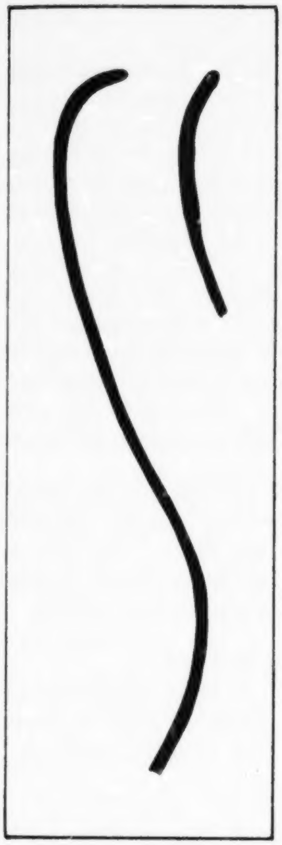
Surface finish includes corncob scraping, wiping, and smoothing. The scraping is by far the most distinctive finish, consisting of numerous parallel, evenly spaced striations produced by the hard lower glumes of the cob cutting into the clay. These are seldom closer together than two millimeters and usually spaced at three millimeters or more. They are most prominent on exterior surfaces and especially pronounced on the lower two-thirds of the vessel. The upper one-third is often more carefully finished. In some cases, it also bears corncob scraping, in which case it appears to have been applied with a downward motion at an angle of 45 degrees or greater to the rim. In other cases, the upper exterior surface is carefully smoothed, usually by wiping. Faint striations at various angles often show sets of evenly spaced lines at distances of .5 to .7 millimeters and sometimes even fainter striations can be made out between them. The striations are often negative, in relief rather than indented. They are probably the result of wiping with the leaves of a monocotyledonous plant, grass, reed or corn husk the most likely. Interior surfaces are wiped or scraped parallel to the rim and tend to be more carefully finished in the lower portions. Small jars are often merely roughly smoothed. Surface color ranges from black to light gray to buff. Walls are quite thin, varying from two and one-half to five millimeters, usually being thicker in the basal portion. Even in the one small and rather crude jar from Hogan 8, the walls are thin, attaining a maximum of only six millimeters at the base. The paste is invariably dark, being heavily impregnated with carbon from use over cooking fires. The clay often has a rather grainy look and the walls break easily with a crumbly to jagged fracture. The larger vessels are moderately well fired, but the one smaller example is quite soft.

Temper varies sufficiently that it can be assumed that the vessels were made at different places. The small jar is tempered with a coarse grained sandstone, probably originating in the Ojo Alamo Formation. While this does not occur within Chaco Canyon, it is found quite nearby, the closest source being on the Escavada, a very few miles to the north.

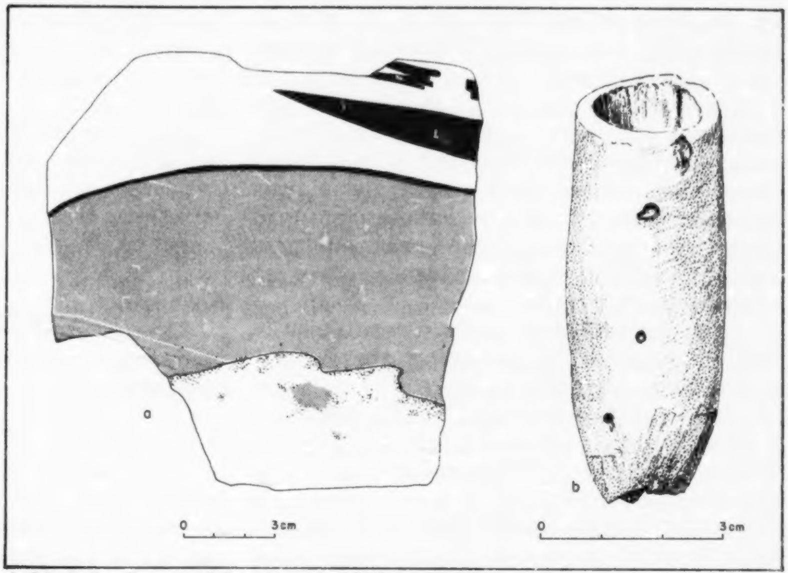
At least two of the larger vessels have a non-local temper of volcanic black hornblende, gold to dark biotite mica and quartz according to identifications by Helene Warren (see Appendix C). Either the Jemez Mountain volcanic region to the east or the San Mateo region to the south could be the source, the latter being the most likely on geological grounds. Importation of utility vessels from such a distance is



Small Navajo jar.



Rim profiles of large Dinetah utility jars.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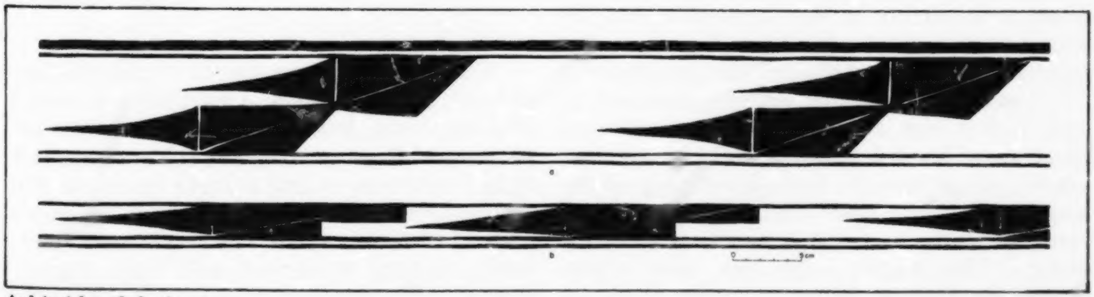
Ashiwi sherd, a straight pipe, cloud-blower type.



Ashiwi bowl design.

unexpected, for they are large fragile objects. Whether the transportation of the vessels involved actual intratribal trade or merely reflects the range of members of the Chacra Band is uncertain. It is, of course, possible that the tempering material alone was imported and the vessels manufactured at or near the Doll House Site. The large cooking pots would have required great care in building up the thin walls. They were undoubtedly objects in which their makers took pride, so that concern to obtain favored tempering materials, particularly with horse transportation available, may not be unexpected. Although pack animals could carry either, as could pedestrians, pottery would be at greater risk of breakage on a skittish horse. Burros, on the other hand, might have been considered sufficiently steady animals that they could be loaded with finished vessels. No unused tempering material was identified in the excavations, but the quantity of excavated Navajo sites in the Chaco country is still so small that negative evidence cannot yet be given much weight.

Only three cooking vessels were sufficiently well represented by matching sherds that partial restoration was possible.

One of these was a small jar (fig. 86) found northwest of the hearth of Room 1 in Hogan 8. This is the vessel with local temper, soft paste and a rather rough finish. The clay refires to a yellow buff and is probably also of local origin. It has a mouth diameter of about 10 centimeters and is about 12 centimeters in height. The very small size suggests a specialized use, perhaps for cooking medicinal compounds used during curing ceremonies. If it is typical of the ceramic skills available among the residents of the site, it lends some weight to the suggestion that the larger vessels were imported. It may, however, be merely the product of a novice's early efforts.

A second vessel (fig. 87a) represented by only a few rim sherds from the northwest quadrant of Room 2, Hogan 8, was a large, well-made cooking jar with corncob scraping all the way to the rim. Less than half of the rim remains. Estimated rim diameter is 19 centimeters. The walls of the rim show slight thickening and the angle at which they are everted is relatively moderate, about 28 degrees. The temper is of volcanic origin, either it or the entire vessel being imported and possibly evidence of intratribal trade. The clay is red-firing, a characteristic uncommon in local Chaco clays.

The third (fig. 87b), from near the northwest wall of Room 1, Hogan 10, has the corncob scraping on the exterior below the rim partially obliterated by wiping, the scraping being conspicuous on the mid-portion of the body, however. The rim diameter is estimated at about 25 centimeters on the basis of about one-half of its circumference. The rim is strongly everted, at about 50 degrees, and lacks any thickening. The temper is also of igneous origin in this vessel, but it differs slightly from that in the large jar from Hogan 8. It also is made from a red-firing clay. The differences in rim treatment suggest manufacture at a different place as well.

Both the micaceous and transitional varieties of Dinetah Utility were relatively rare and present only in surface collections. Many sherds have flecks of mica, but usually so few that they cannot be assigned to the micaceous variety.

Gobernador and Navajo Painted.

The few small sherds in these categories are inadequate material upon which to base descriptions.

Navajo Utility.

This appeared only at Hogans 15 and 17, both of which seem to date from the mid-range of site use. Both sherd and sand temper appear, but walls are considerably thicker than in Dinetah Utility. One rim sherd indicates a relatively direct rim devoid of decoration, although it is so small that use of a fillet could have been lower on the vessel than the lowest part of the sherd.

Ashiwi Series.

Zuni was the major source of trade pottery and only from there was a partially restorable Puebloan vessel found, a low wide bowl from the ash heap of Hogan 20 (fig. 89). It has a diameter of 27.7 centimeters and a depth in excess of 9 centimeters. It has the typical sherd tempered paste of the Zuni region. The rim is sculptured, being slightly thickened and very slightly everted. Although most of the bottom is missing, there appears to have been no interior design except around the sculptured lip which is separated from the central area by two black lines in mineral paint. Three sets of a pattern of diagonally oriented red and black triangles provide the design. It is noteworthy that many Zuni bowls from this area lack an interior central design, if the sherd evidence is representative, a tendency that may reflect preferences among the Chacra Navajos. The exterior has a red base separated from the white slipped decorated zone by two black lines. The rim is painted black on the lip on the exterior with a narrow black line below; this helps to bound the decorated band. The decorative band is about 6.5 centimeters wide and has a creamy white, slightly crackled, slip similar to that on the interior. The design is a variation on the common Zuni exterior pattern of two pairs of black and red triangles arranged diagonally.

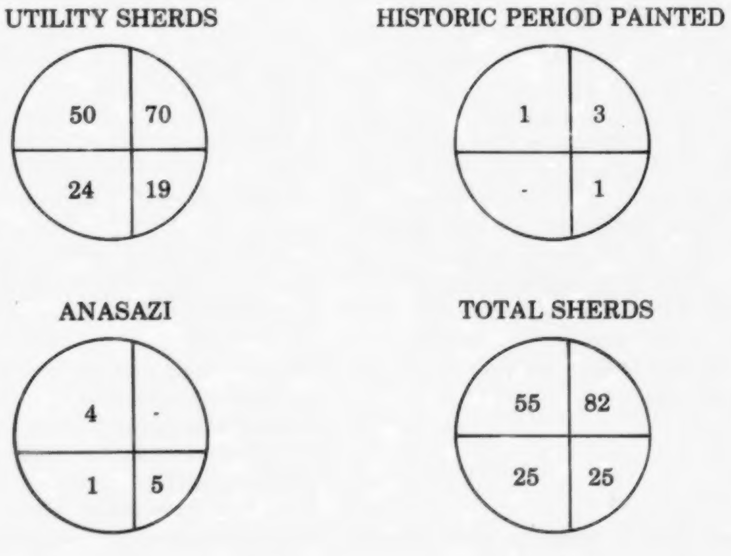
While the line work is not fine and precise as that in some bowls of Kiapkwa Polychrome, the color combination and design style would certainly place it in that type. The large sherd from under a ledge on the talus (fig. 88a) has only a very small part of the design present, but this has the very careful painting that is more characteristic of the Kiapkwa style. The two small sherds from the Pueblito 3 ash heap are similar to several collected by Vivian and probably all came from one bowl. All are so small that overall design cannot be reconstructed, but the precision of line and the features present seem to indicate another Kiapkwa Polychrome bowl, in this case with an interior design.

A few small sherds with highly polished red which appears much harder than that used in Kiapkwa Polychrome have been classified as Ashiwi Polychrome. None of the Zuni area sherds can be classified as Zuni Polychrome, nor even late Kiapkwa Polychrome.

Ceramic Distribution.

The relevance of type distributions by structure to dating has been discussed above. Distributions within and around the structure that might provide functional interpretations have also to be considered. Control of locations is far better for the floor areas than for exterior space, because the sampling system was followed very closely in the interiors. Unfortunately, much of the exterior collection comes from surface proveniences, and a good sample cannot be considered to have been acquired.

The interior sherd distributions are as follows by quadrant, the figures being the totals from all fully excavated structures:



Sherd distributions, hogan interiors.

It is immediately evident that for historic period sherds the tendency is for a distribution in the northern half of the dwelling with the greatest concentration in the northeast quadrant. This is the portion of a hogan floor most commonly used for kitchen purposes in traditional Navajo hogans. It is also the direction in which the early wall hearths were normally placed, the only exception being in two-room structures where the hearth in the later room was the southeast quadrant, probably a practical adjustment that reduced the danger of setting fire to the roof.

Whether an older tradition that the culinary area of a dwelling should be in this sector has led to the placing of wall hearths or architectural conventions associated with wall hearths brought about the customary usage is somewhat uncertain, although pueblito architecture shows so little regularity in hearth placement that an older Apachean tradition seems the more likely alternative. The ceramic data provide strong indications that the traditional Navajo concepts of division of interior space were already being practiced by the 18th century on Chacra Mesa, at least with regard to the cooking area.

Despite weaknesses in sampling design, the exterior distribution of sherds is also of interest. Virtually all sherds close enough to dwellings that they might reasonably be assumed to relate to the occupation of a particular structure were found to the north of a line bisecting the floor through the center of the entry. About one-third of these sherds was recovered from ash heaps or presumed ash heaps, the quantities being such that at least some disposal of broken vessels on ash heaps at this time is obvious. It would appear that activities in which pottery was utilized outside the hogan normally took place toward the north, at least at this site. Some of the sherds found to the northeast may represent no more than pieces accidentally dropped in taking broken vessels from the hogan to the ash heap.

Mineral

An active lithic industry still existed despite the availability of metals from the Spanish settlers along the Rio Grande. The rarity of metal suggests that only very limited quantities were reaching the Chacra Navajos, so that stone tools remained common types for many purposes.

Ground Stone.

Metates. The largest stone artifacts were metates. These were rare, only three broken examples being encountered. The metate from the mealing bin in Hogan 8 had been removed, probably by the occupants when the structure was abandoned. All three metates were of local fine-grained sandstone of a light color. Two were slab metates with flat to concave grinding surfaces and roughly shaped edges. The remaining example was about one-half of a broken shallow trough metate. At least one of these fragments, that from Hogan 8, had seen use as a part of the masonry in the walls of the hogan in which it was found, and similar use of the other two is not precluded by the available evidence.

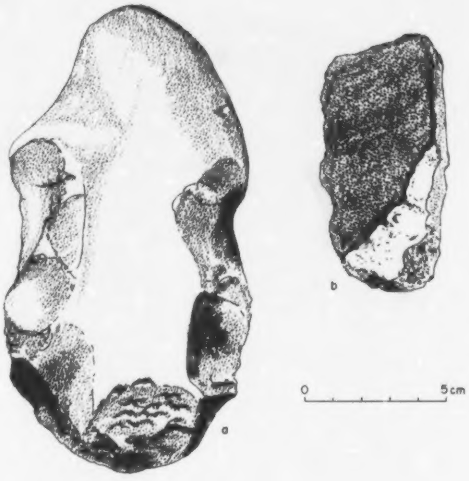
Manos (figs. 92 and 93). The most common ground-stone implements were manos. There were 13 manos found, one being represented by two fragments (fig. 92a). The favorite material was the same light-colored sandstone utilized in the manufacture of metates, but one was of a darker sandstone and one of basalt.

Ten of the manos were of the two-hand type commonly used on slab metates. Of these, only one relatively short specimen was complete. It measured 19.8 centimeters long. One broken mano exceeded this, however, with an incomplete length of 28.9 centimeters. Widths vary from 8.5 to 12.0 centimeters and thickness from 2 2 to 4.0 centimeters. Five of those were used on one side only, three on both sides and two were unused "blanks." The usual shape was roughly rectangular with one straight side, one convex side and rounded ends. Two had been used on only one side, but in two different planes, producing a ridged cross section.

Two of the "one-hand" manos were well shaped ovoids used on both sides. The working surfaces were somewhat convex with curvature on each side being slanted relative to the edges in such a manner that the highest portion of the grinding surface extended from the upper left corner to the lower right. This suggests a crushing action in use, probably by a right-handed user, as opposed to the straight back-and-forth motion most common with the two-hand manos. The third specimen is a heavy sandstone cobble with pecked edges and one working surface, altogether a much less finished tool which was doubtlessly used for other purposes than the more standard types.

It is generally conceded that the principal use of two-handed manos was for grinding corn and other grains, a function that would be reasonable in the context of this site. The one-hand mano has been attributed to such uses as crushing seeds and macerating jerky, both compatible with the contexts in which they were found. These primary uses may be fairly safely assumed, but there exists evidence of secondary use in ways not so closely tied to food preparation. One of the two-hand manos and two of the one-hand manos have very shallow notches chipped on the edges as though for hafting as mauls. The two-hand mano lacks any significant battering of the ends however. One one-hand mano has only one notch and was probably never completely reworked for use as a maul. The other has two notches which are somewhat closer to one end than the other and does have evidence of battering on the larger end.

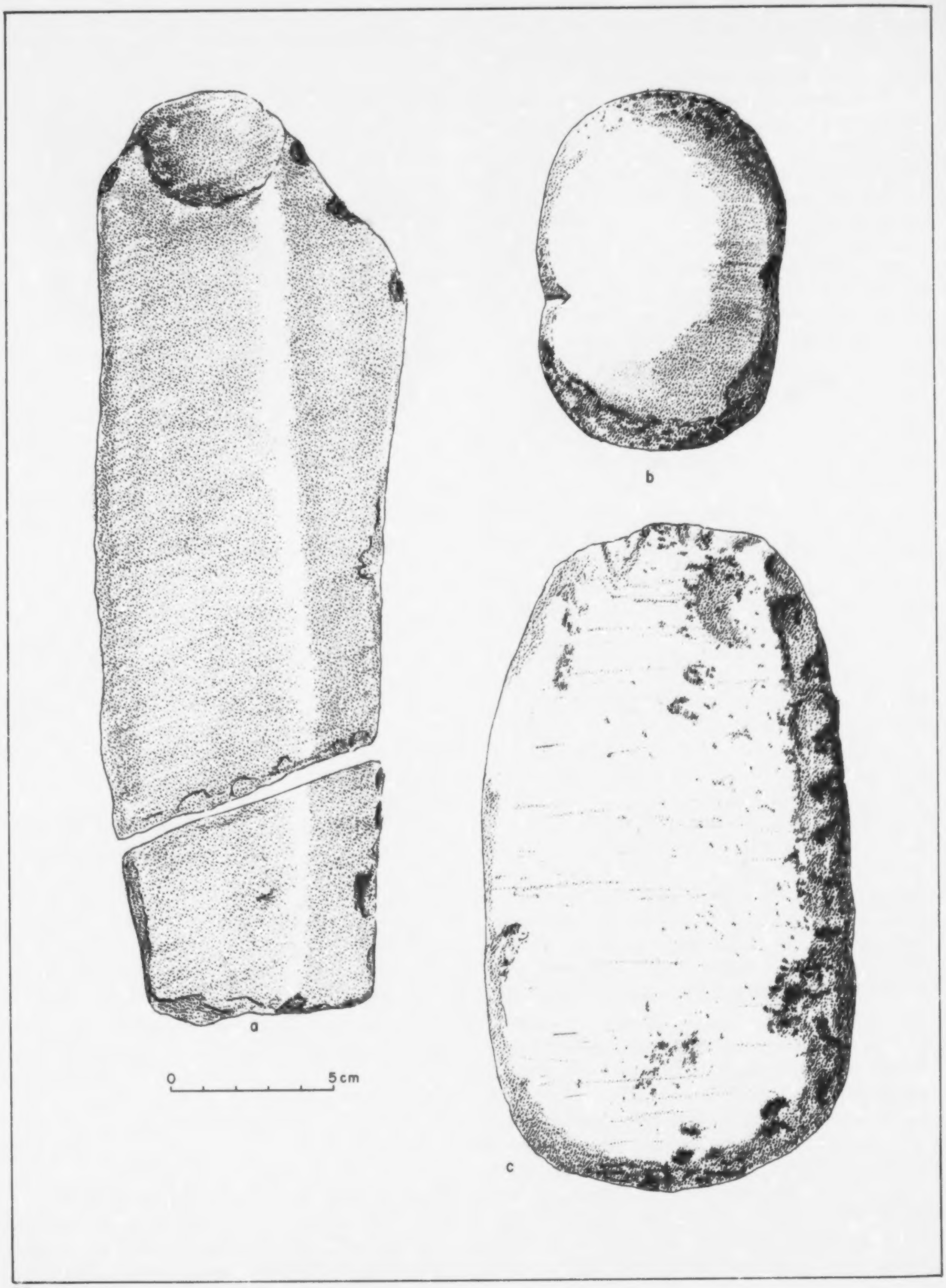
Two of the broken two-hand manos are stained red, suggesting use to grind pigments. Two pieces are present from one of these manos and in this instance only one piece is stained, indicating that this secondary use took place after the implement had been broken and was no longer serviceable for its original purposes.



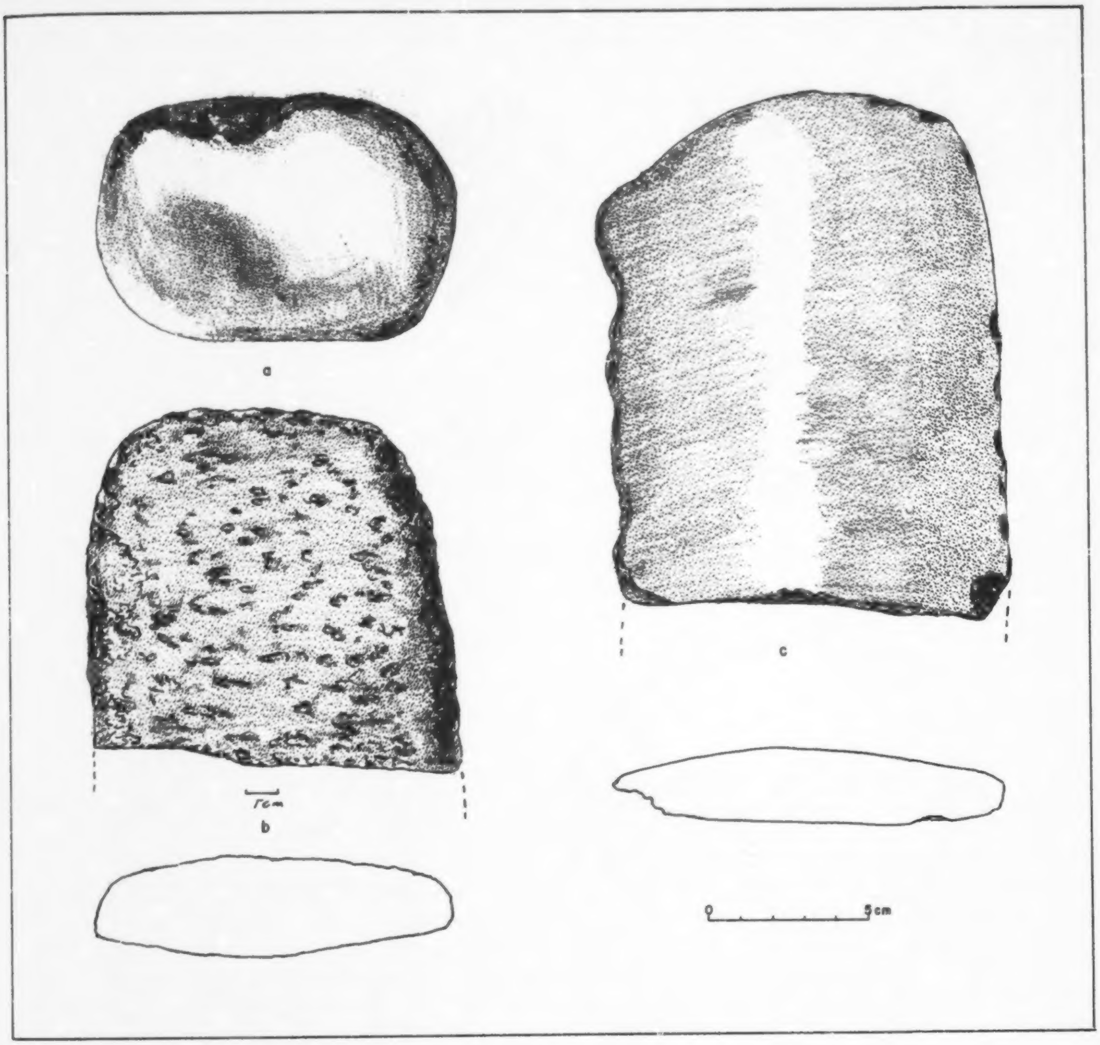
Maul and piki stone fragment.

Piki Stones (fig. 91b). Five fragments of sandstone slabs that were well finished on one side and ranged from 1.5 to 2.0 centimeters thick were found, all from the vicinity of Hogan 10. The smooth surface was darkened, as though impregnated with carbon. Four of these were encountered at the hearth in the entry to Room 1, the other being found outside the hogan. These are pieces of the stone griddles used to cook piki bread or wafer bread. The use of pinyon pitch for preparing the upper surfaces was mentioned by Navajo workers at the time of excavation, a method that seems to have been the most usual manner of preparation (Kluckhohn, Hill and Kluckhonh 1971). Although sometimes referred to as comals or *comales* in the literature, this latter term is better reserved for application to the ceramic griddle of Mexican origin.

Maul (fig. 91a). One maul made of an indurated dark gray porphyritic rock, possibly an andesite cobble from the local gravels, was found in Room 1, Hogan 10. Shaping had been by rough percussion flaking followed by pecking of shallow grooves for hafting. One or both ends may have originally been sharp for use as an ax, but both are now battered sufficiently



Manos.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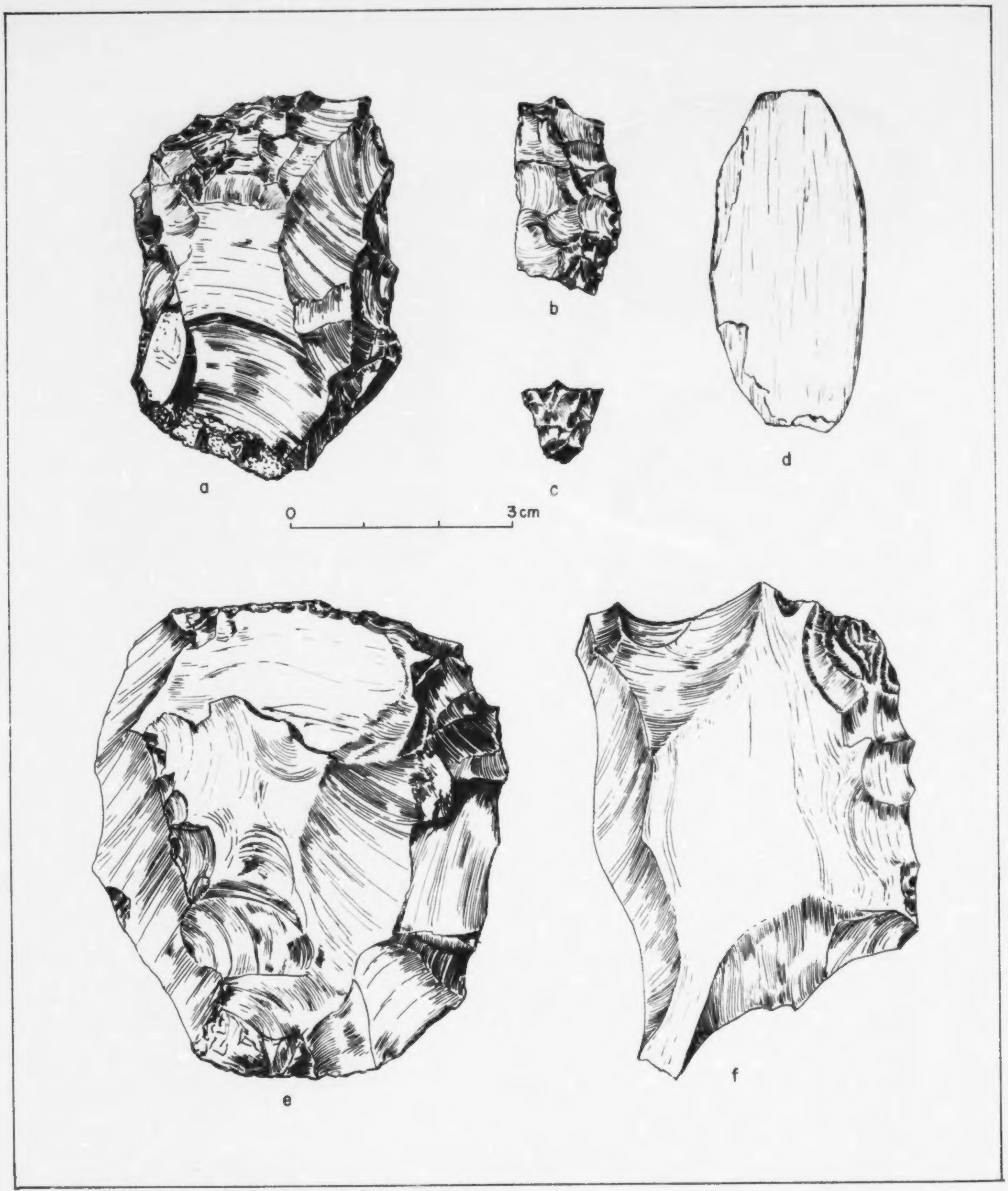
Manos.

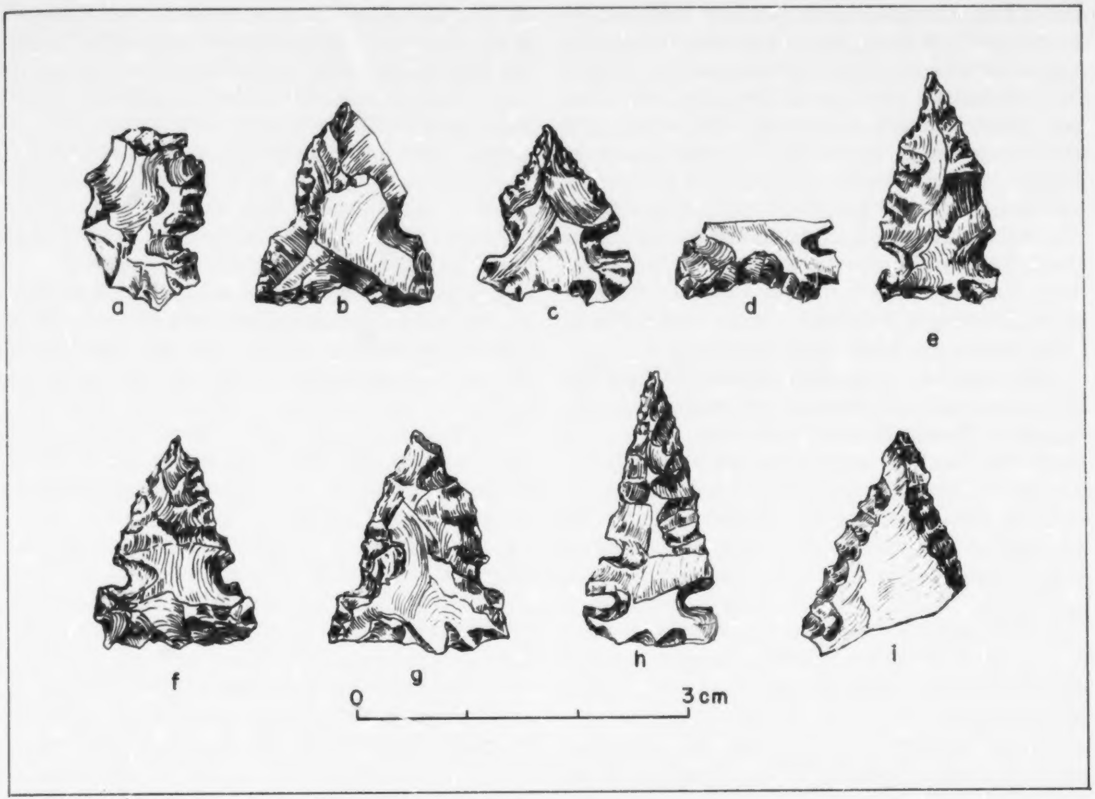


Pendant blank, blade, drill, choppers, hammerstones.

that use as a maul is certain. It measures 15.5 by 8.0 by 4.7 centimeters. It is a product of both ground stone and flaking techniques.

Beads. One discoidal bead with a length of .14 centimeters, a diameter of .4 centimeters, and a hole .14 centimeters in diameter was found on an ant hill near Hogan 4. It is probably made of calcite, but might be a bone artifact.

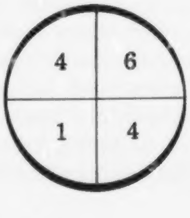
Pendant blank (fig. 94d). An elongate thin tablet of dark gray-green phyllite is abraded on



Projectile points.

the edges and both surfaces. It measures 4.4 by 2.0 by .4 centimeters. It is probably an unfinished pendant, lacking only the hole, but could have been a fetish item in a medicine bundle. The material is found in gravels from the Pedernal area, erosion having distributed it along both the Rio Grande and San Juan Rivers.

Distributions. Excluding the maul and ornaments, the ground stone artifacts are objects whose primary functions were food preparation. Interior distributions seem to reflect this usage, again indicating culinary activities most commonly localized in the northeastern part of the dwelling:



Ground stone distribution, hogan interiors.

It is probable that secondary usages account for a part of the spread. Exterior distributions are too limited to be of much value, three specimens being to the northeast of the entries and one to the southeast.

It is worth noting that all materials utilized, with the single exception of the basalt mano, were of local origin or probable local origin.

Chipped Stone.

Projectile Points (fig. 96). The Doll House Site has produced a relatively large number of projectile points, four from surface surveys and six from the excavations. With one exception, these points appear to be sufficiently similar that they may be considered to fall within a single type that can be called Navajo. Whether they will be found to differ significantly from other Navajo points remains to be determined. For purposes of identification, they will be termed Chacra Points herein.

Chacra Points have straight to convex sides, rarely somewhat concave (one example only), straight to concave bases, shallow side notches and usually wide tangs. They are frequently curved or at least more humped on one surface than the other, often being semi-uniface. They are short relative to width, the length not exceeding twice the width. Dimensions range from 15 to 20 millimeters in length and 10 to 15.5 millimeters in width, with thickness from 2.0 to 4.5 millimeters. Materials include local white chert, Pedernales cherts, white petrified wood, gray Morrison quartzite from south of Crownpoint, Polvadera Peak obsidian, and a white to tan Arizona petrified wood.

The one point that does not fit the type (fig. 96h) is probably of Anasazi origin, having been found at Hogan 8 near a deposit of Anasazi trash, but coming from within the hogan. It has straight sides and base and three side notches. It measures 24 millimeters by 11.4 millimeters by 3.0 millimeters. It is made of a tan petrified wood, the source of which has not been identified.

Three of the points have no provenience data from within the site. The remaining seven were all collected in Cluster II. One is from the ash heap of Hogan 7, one from Room 1 of Hogan 8 and the others from Hogan 10, the latter all being from the exterior and east of the structure.

Flakes. A total of 116 flakes, most unutilized, give ample confirmation for the practice of a knapping industry at the site. Of these, 12 showed signs of casual use, another 16 may have had some use and the others were all unused and presumably represent nothing more than debitage. The great majority are of local materials, nearly three quarters being the local white petrified wood. Of the exotic types, the sources were not exceptionally widespread. There was one example of chert from Washington Pass and 10 obsidian scraps are from the southern portion of the Jemez Mountains.

Debitage was concentrated at three structures, Pueblito 3, Hogan 8 and Hogan 10. Most other excavated structures produced at least a few flakes except for Hogans 1 and 15.

Dimensions are as follows: length - .5 to 5.2 centimeters, width - .4 to 4.0 centimeters and thickness - .15 to 2.6 centimeters.

Blade (fig. 94b). Only one blade fragment, produced from local dark brown petrified wood, was recovered.

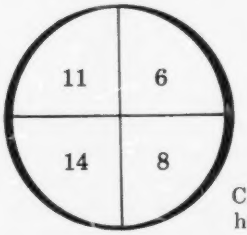
Drill (fig. 94c). One piece broken from a drill close to the base was of dark brown jasper with dendrites. The material is probably from the Red Mesa Valley near Prewitt.

Choppers (fig. 94f). Two choppers, both of local petrified wood, were recovered. One, a thick discoidal flake battered on three edges, measures 4.1 by 4.4 by 1.7 centimeters. The other, a rectanguloid biface, had cortex along one side and is battered on one edge. It measures 6.0 by 4.1 by 2.1 centimeters.

Hamerstones (fig. 94a and e). Five hammerstones, all of the local white petrified wood, exhibit the extensive battering characteristic of the artifact type. Both of these and the choppers were probably used in manufacturing and reconditioning manos and metates. Sizes range from lengths of 4.8 to 8.6 centimeters, width of 3.1 to 6.5 centimeters and thicknesses of 2.6 to 3.8 centimeters.

Problematic Object. A thick flake struck from the end of a quartzite sandstone cobble is abraded at two points along the edge. It measures 8.6 by 4.6 by 4.4 centimeters. Its use is unknown.

Distributions. The overall distribution of chipped stone contrasts markedly with that of ceramics. Interior distribution is as follows:



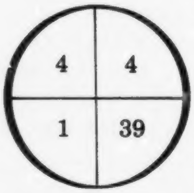
Chipped stone distribution, hogan interiors.

The preponderance of chipped stone is clearly toward the rear of the dwellings with the greatest concentration in the southwest. Exterior distributions seem to cluster on the south and the northeast of the structures. The conclusion that this denotes activity areas defined by division of labor must not be made too quickly however. While chipped stone tools are associated largely with hunting, a typically male occupation, they are also used in butchering. Today at least, the butchering of domestic sheep and goats for food is generally a woman's activity. There is some indication that butchering was often done to the northeast of the dwelling in the present data, but whether by men, women or both cannot be ascertained from the archeological data. There is, perhaps, some justification for suggesting that the southern or western half of dwellings was normally the man's activity area.

Pebbles.

One of the more puzzling kinds of finds on the site was the numerous small pebbles brought in from the higher gravel areas on the mesas. These were found in association with six of the dwellings. At first they were thought to be polishing stones for use in making pottery, but they lacked any sign of wear and soon proved to be far too plentiful for such use, particularly for a site where pottery making was certainly not a major activity. One cluster of 22 pebbles was found against the southeast wall of Room 2, Hogan 10, in a corner, with another 11 nearby that were probably part of the grouping. This is so similar to the pebble caches noted on the survey that it undoubtedly derives from the same cause. If the suggestion that these were playthings accumulated by children is applicable to such finds, these are probably no more than souvenirs picked up by youngsters while herding the families' flocks. As such, they give some support to the suggestion that herds were taken to the higher elevations to the south at least on occasion, but certainly do not show that this was the only area used for range.

The distribution of these pebbles is of some interest. Within the dwellings it is:

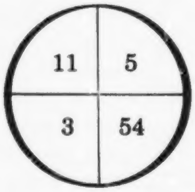


Pebble distribution, hogan interiors.

The strong concentration in the southeast quadrant is the result of the pebble cache found in this section in Hogan 10. Exterior distribution is to the south and northeast of dwellings, very much like that for chipped stone. Whether these distributions are indicators of children's activity areas is quite uncertain. Some similarity of this distribution to that of Anasazi sherds, in particular, the fact that the highest concentration of both is in the southeast part of the dwelling, may provide some support for the suggestion that these do represent areas where children often played. But again, the assumption that most such sherds were also carried into the site by children must be made which, while a logical one with some ethnographic support, cannot be demonstrated for this time level with much assurance.

Bulk Mineral.

Various exotic mineral substances were found in the deposits in small quantities. Most common were pieces of gypsum. In all, 16 pieces of this material from seven proveniences were recovered. All were unmodified and since gypsum occurs naturally on the talus slopes immediately below the hogans, no great effort was required to obtain it. All except two pieces came from within the dwellings, however, so that purposeful transport is apparent. Although it is sometimes used by Navajos today to whiten wool used in weaving, it is by no means certain that this completely explains its presence here. It is noteworthy that this attractive mineral, doubtlessly another tempting item to wandering children, also occurs most frequently in the southeastern quadrant of dwellings. If Anasazi sherds, pebbles and fragments of gypsum crystals are combined as functional equivalents, this distribution is quite striking:



Distribution of pebbles and gypsum crystals.

Second in frequency were small pieces of hematite, a material available in many places in the area. Fourteen fragments from five proveniences, again all but one from dwelling interiors, were found. Two pieces, one from Room 1, and one from Room 2, Hogan 8, showed some abrasion indicative of use for pigment. The others were unmodified. Only House 4 and Hogan 8 produced hematite. These two structures are those in which manos with red stains from use in grinding pigment were found.

Three small unmodified pieces of limonite were found near the floor of Room 2, Pueblito 3.

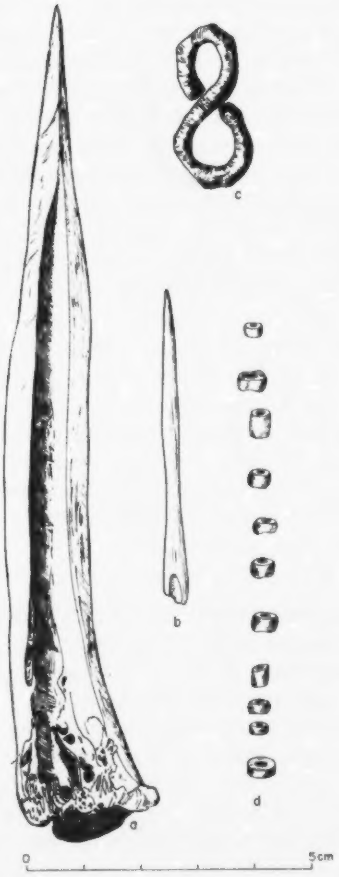
A small lump of clay from the Menafee Formation was found in Room 1, Hogan 6.

Glass

Glass was quite rare on the site and most of that observed could be attributed to the present century.

Beads (fig. 100).

Ten glass beads were obtained from the excavations and two from an ant hill. All would fit Carlson's (1965) Type V and probably date from the 18th century or possibly into the early 19th century (Robinson, 1976). Three are short, tubular; the others are globular to discoidal. Diameters range from 2.5 to 4.6 millimeters, lengths from 4.3 millimeters for the tubular beads to 1.8 millimeters for the most discoidal, most being about two to three millimeters long. Holes are generally about 1 millimeter in diameter, but range from .5 millimeters to 1.2 millimeters. Colors include opaque white, opaque and transluscent blue and red with a black core.



Bone, glass and metal artifacts.

Bottle Sherds.

Seven sherds of modern bottle glass were collected near Hogan 24 on the canyon floor. In addition, a few sherds of bottle glass were observed near Structure 22 which were not collected. All clearly postdate the 18th-century occupation.

Metal

As with glass, metal was quite rare except in Cluster IV, the modern portion of the site. The butchering marks on the bones do indicate the use of metal tools, however. Both metal knives and axes were used and were probably obtained in trade with the Spanish colonists or from Pueblo sources.

Chain Link (fig. 100).

One figure-eight link from a chain was found on the surface near Pueblito 3. It measures 2.8 by 1.3 by 33 millimeters. Its most probable origin is from a small chain from a bridle bit. An 18th-century date is certainly possible, but by no means certain.

Tin Can.

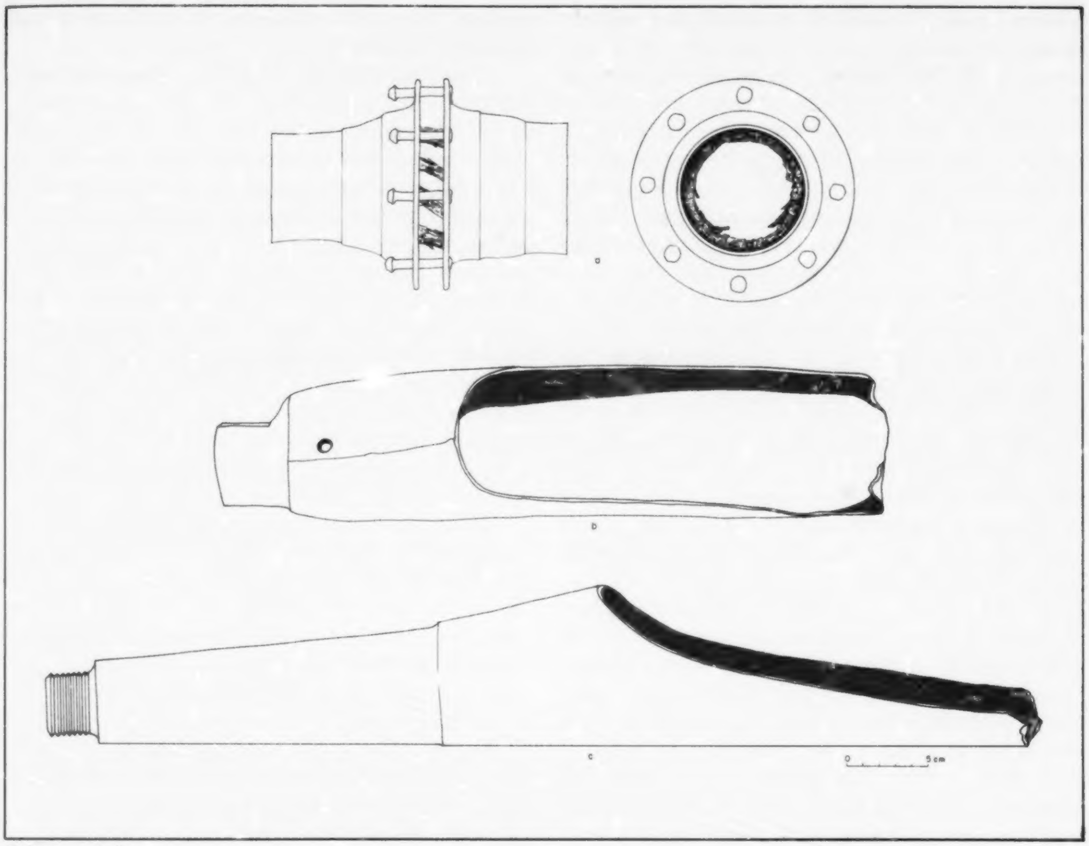
A tin can was found wedged between two rocks in the masonry wall of House 9. This is an obvious recent intrusion, but whether it derives from the modern Navajo occupation at Cluster IV, a use of the ruin as a campsite by Spanish-American herders or even the lunch stop of more recent visitors to the site is not known.

Other Metals.

At Cluster IV, there was considerable modern metal, including heavy chain, wagon parts, tin cans and enameled metal, most of which was not collected. Axel housings from a wagon show secondary use (fig. 101).

Bone

In view of the relatively large quantity of bulk bone recovered, the number of bone artifacts was rather small.



Other metals.

Awl (fig. 100a).

One awl, produced from a split metatarsal of a mule deer (Appendix D) with one end unmodified, the other ground to a point, was found in House 4. It is in good condition, only a small chip having been lost from the tip. A hole near the proximal end appears to be entirely natural, it exhibiting no wear such as might be produced by a thong for suspension. Dimensions are 14.5 by 1.8 by 1.7 centimeters.

Needle (fig. 100b).

A bone splinter from the ash heap of Hogan 10 is the distal end of a needle. It has a blunt point and grooves on the surface below the break suggest that it had an eye. It measures 5.3 by .35 by .22 centimeters.

Tubes.

Four bird bone tubes were found in Hogan 8. Three of these were together on the floor and very close in size, lengths ranging from 3.1 to 3.3 centimeters, widths from .7 to .9 centimeters and thicknesses from .6 to .7 centimeters. The fourth from the fill of the same quad, was considerably shorter, 2.5 by .75 by .55 centimeters, not appearing to belong in a set with the others despite its proximity in the deposits, although faunal identifications suggest that it may be a part of the set.

Bead.

The bead described above under ground stone may be made of bone, but is too small to allow for certainty.

Cut Bone.

One piece of long bone from Hogan 8 was cut on one end, the severed piece perhaps having been utilized in some way.

Bone Waste.

Total recovery of bone amounted to 1,250 pieces, most of which were unworked or bore only butchering scars. A preliminary faunal analysis by William B. Gillespie appears as Appendix D. The majority of bones are those of domestic animals and give good evidence for the practice of a pastoral economy by the residents of Clusters I and II. Domestic sheep and goats make up almost half of the minimal faunal count. It is readily apparent that these animals were being used for meat and that they were butchered on the site. Deer and antelope are not only less numerous by almost 50 percent, but the differential presence of various anatomical parts indicates that they were killed at some distance from the hunters' homes and much butchering accomplished at the kill sites or hunting camps before the remains were brought back. One relatively large deposit of deer bones in Hogan 8 suggests use of the structure as a hunting camp after its abandonment as a habitation, probably after all of Clusters I and II had been evacuated. Anatomical elements again indicate primary butchering away from the site, however. A few of these bones were broken so as to produce sharp edges which show limited polish and chipping, suggesting that they were employed as scrapers for cleaning the hides of deer from which they came, being discarded after use. The evidence of wear is slight enough that it is probable that only rough initial cleaning of the hides was accomplished with these bones.

The question of facilities for care of livestock becomes significant in light of faunal remains. The small feature considered a lamb pen adjacent to Room 1 of Hogan 10 may be considered more likely to have actually received this use. All corral remains were on the talus slope below the 18th-century dwellings and were considered during field work to have been associated with Cluster IV. All are simple stone structures, however, for which no dating is possible and it is not improbable that parts of these remains date from the 18th century. No indication of corrals, either of rock or brush, were found on the top of the bluff, but stock enclosures of the latter material might not have survived in recognizable form. The healed fracture of a sheep ulna from Hogan 15 suggests considerable care of individual animals.

Weaving of wool and tanning of buckskin, both crafts documented for the 18th century, were probably undertaken on the site by the earlier occupants, despite the lack of direct evidence of either.

The few *Equus* bones from Hogan 15 add weight to the suggestion that the one probable early iron object is the link from a bridle bit chain, but do not themselves show that equine stock was included among the domesticates possessed by the 18th-century inhabitants. The animal may have been a horse, a burro or a mule and has marks indicating that it had been skinned. It is not unlikely that at least the choicer parts became a contribution to the diet of the people as well. The fact that the bones of the lower limbs were still articulated is suggestive that the creature provided more meat than the resident population could easily consume and that the less productive portions were discarded without complete butchering.

Hunting of small game was obviously a very unimportant activity. Cottontail rabbits are found on the site today and sometimes seek shelter within the hogan ruins, which together with the lack of butchering marks on cottontail bones makes determination uncertain of whether they were utilized. It is probable that some of the cottontails as well as the wood rats were killed by boys for the slight contribution they might have made to the diet, as were the jackrabbits which were almost certainly brought to the site, although probably not from any great distance. The kangaroo rats, like some of the cottontails, were probably postoccupational intruders. The lack of prairie dog, a traditional Navajo delicacy, is noteworthy.

The bird bone tubes are possibly from chicken ulnae (Appendix D), a rare occurrence if the identification is correct, but not entirely unexpected. Chicken-like birds appear in a very few rock art panels in the Largo-Gobernador region and chickens were kept by the Christian population of the Spanish colony in the Rio Grande drainage.

Distribution of waste bone within dwellings appears to be of little significance with regard to use areas. Most if not all of this bone, particularly in Hogans 8 and 15, is trash deposited in the structures after abandonment as living quarters. High bone counts from the ash heaps at Hogans 7 and 10 show some disposal of bone in this location. Bone counts also tend to be high to the northeast of entries. Whether this is associated with disposal in ash heaps or represents a customary butchering location is not certain, but the finding of three of the 10 projectile points in this same general area at Hogan 20 would suggest that the latter might be the case.

Vegetal

Although preservation was relatively good for harder vegetal materials, few were found in their original state. Charred materials were not uncommon, however. Pollen and flotation samples were also taken, but have not been processed as yet and cannot be reported herein.

Wood Fragments.

The Laboratory of Tree-Ring Research provided species identifications for the miscellaneous fragments of wood and charcoal obtained in the excavations.

TABLE 10 Distribution of Miscellaneous Wood Specimens.

	JUNIPER		PINYON		PONDEROSA		NON-CONIFER	
	Wood	Charcoal	Wood	Charcoal	Wood	Charcoal	Wood	Charcoal
Hogan 8								
Hearts & Ash Heaps		25		41				6
Other		138		76				11
House 9								
Hearts & Ash Heaps								
Other	1	18		10				1
Hogan 10								
Hearths & Ash Heaps		568		162				44
Other		106		22		69		99
Hogan 15								
Hearths & Ash Heaps		144		11				
Other	19	25	10	23			4	
Hogan 1								
Hearths & Ash Heaps		16		1				
Other		2						
House 2								
Hearths & Ash Heaps								
Other	1	94		7				20
Pueblito 3								
Hearths & Ash Heaps		48		23				10
Other	3	29						
House 4								
Hearths & Ash Heaps				35		3		5
Other				1				
House 7								
Hearths & Ash Heaps		180		27				20
Other								

Three species, pinyon, juniper and ponderosa pine, were found, along with a few non-conigers for which specific identifications are not available. The latter may be from shrubby plants not normally included in keys for the indentification of commercial timber. Distributions are shown in Table 10.

It will be noted that all uncharred specimens are from proveniences other than hearths and ash heaps, while most charred specimens are from hearths and ash heaps, as might be expected. The relatively high proportion of charcoal specimens from "other" proveniences is doubtless due to random scattering of charcoal through the site by wind and water, rodents and miscellaneous causes as well as specimens not sacked as hearth material when some doubt as to true association existed. The large proportion of uncharred wood from Hogan 15 is structural material. The wood from elsewhere may represent fragments of structural wood, but the identification of this use is uncertain.

The problem of charcoal from "other" proveniences is particularly significant for Hogan 10. All but three of the 72 pieces of ponderosa charcoal are from this hogan and all 69 are from locations other than hearths. Neither this nor any other structure on the site had burned. It seems probable that even here the material represents firewood rather than structural wood or minor artifacts. No ponderosa pine now grows close to this site, but if it were used as firewood, it is probable that it came from a nearby source, probably a single relict tree in one of the rincons or canyon heads.

Wooden Peg.

A stick which was comparable to those in the walls of Pueblito 3 was found on the surface inside the west wall of Room 2. It is the woody portion of the stem of a slow growing cholla cactus.

Pinyon Shells.

One piece of the shell of a pinyon nut was found on the floor of the House 2 and two pieces on or near the floor of Room 1, Hogan 8. It is possible that these were introduced by rodents into these structures shortly after abandonment, but they are more likely evidence of dietary habits of the occupants.

Juniper Seed.

One juniper seed on the floor of Room 2, Pueblito 3, may also date from either the period of occupation or somewhat later. A small hole near the proximal end indicates attack by rodents or insects.

Maize.

Only seven specimens of *Zea mays* were collected. Six of these were charred and fragmentary, in two instances of such misshapen cobs that they were almost certainly from nubbins. Not all of the measurements reported below were possible on all specimens due to their fragmentary nature. The seventh example is a dessicated cob of which perhaps one-half was recovered. This was found inserted into the wall between the two chambers of Granary 20 and had been placed there while the mortar was still wet. Of the charred specimens, three are from Hogan 8 and three from Hogan 10. No kernels were found.

Cob lengths range from 1.5 to 9.1 centimeters, the largest being the specimen from Granary 20. Diameters average 2.2 centimeters for cobs, 1.5 centimeters for the rachis and .8 centimeters for the pith, giving an average cob/rachis index of 1.4 and rachis/pith index of 1.9. The cupules average 7 millimeters wide, 1.3 millimeters thick and 1.0 millimeters deep. Half of the charred specimens have hairy cupules and those of the dessicated specimen are hairy. Pedical hairs are present on most specimens. Cob/kernel average measurements are 4.1 millimeters wide and 3.6 millimeters thick. Row numbers range from 12 to 16, with three examples with 12 rows and one each with 14 and 16, the 14 rows appearing at the proximal end of the dessicated specimen, the rest of the length having 12. Rachis flaps are prominent in all specimens, ranging from moderate to large. As implied by the measurements, cupules tend to be narrow and most are constricted in the middle. Both upper and lower glumes lack visible venation and are fairly thick. Rachis and glumes are very hard in the dessicated specimen. In its highly indurated rachis, wide but thin cupules with prominent rachis flaps, moderately high row number (based on an extremely small sample) and low cob/rachis index, this lot of corn most resembles such races as Tehua, Tepecintle, and Jala, which are found in Guatemala and southern Mexico. It is probably related to hybrid races such as Tuxpeno which derive from a similar source and extend into northern Mexico (Wellhausen, *et al.*, 1952). The possibility that seed of ultimate Mexican origin was obtained from Spanish colonists must be considered.

Peach Seed.

One half of the shell of a peach seed was found in the fill of Room 2, Hogan 8. The fact that only this one specimen was found suggests that the fruit was not locally grown, but more likely obtained through trade with Spanish colonists or Pueblo people to the east or south.

Interpretations

The chronology of use and abandonment of the various structures at The Doll House Site remains conjectural except in rather broad terms. Most of the structures excavated or tested in Clusters I and II are of late 18th-century origin. An estimated dating between 1740 and 1800 seems reasonable.

Pueblito 3, exhibiting a great deal of the Anasazi-Puebloan architectural tradition so common in the Largo-Gobernador area during the first half of the 18th-century, might on typological grounds be judged one of the earliest constructed. The relatively good preservation of the walls of Room 2 and the fact that little if any masonry had been salvaged for later use in other structures is good evidence that the structure continued in use until past the end of construction activities in Cluster I. The lack of any great quantity of cultural debris seems attributable more to erosion than to a short period of occupation, possibly augmented by early archeological collection of larger sherds or artifacts thus exposed.

Houses 2 and 4 are also quite Puebloid in their features and probably date relatively early. House 4 was virtually stripped of its masonry and was probably abandoned early in the occupational sequence.

Sufficient masonry had been removed from House 2 that a similar conclusion is possible regarding it.

House 7 and Hogans 8 and 10 show little evidence that rock was salvaged for use elsewhere, but are so ruined that abandonment prior to complete abandonment of the site is almost certain. Cultural deposits are sufficient to indicate occupation for a relatively extended period, probably seasonal occupations over a period of several years. The more Navajo-like features suggest a later date of construction than for the pueblito and houses in Cluster I, perhaps by a younger generation.

Hogan 1 and House 9 have some features in common, in particular the use of vestibule entries and placement near the bluff rim where they could serve defensive purposes as lookouts and protection of trail heads. They share both loopholes and good preservation with Pueblito 3. All three structures would thus appear to have been maintained later than the time of abandonment of the three dwellings in Cluster II. The sparsity of trash may be the result of erosion alone, but special functions are suggested by the traditional use of Hogan 9 for war and hunting ceremonies. It is believed that these three structures continued to receive sporadic use by hunting and war parties after the abandonment of Clusters I and II for purposes of habitation.

This extended use probably continued into the 19th-century. Hogan 14 appears to be an 18th-century structure, but the limited testing here did not provide sufficient data for more precise placement.

Hogan 15 is a very crudely constructed feature that was poorly located for prolonged occupation. Ceramic evidence indicates a 19th-century date, while the disposal of bones within the structure suggests nearby occupation following abandonment, again perhaps by camping groups rather than inhabitants of a more permanent homesite. Shelter 22 may be a similar posthabitation campsite utilized by Navajos returning for short-term visits.

The choice of a location favoring concealment and flight rather than fortification for defenses at Cluster III, along with the limited ceramic data, suggest occupation well into the 19th century when warfare with whites, and the threat of attack by organized armies made this defensive strategy important. The light construction of most dwellings in this cluster and scarcity of trash even at Hogan 17 where erosion appears to have been minimal suggest a relatively short span of use.

Cluster IV is obviously primarily the result of a 20th-century occupation, but the possibility that some of the corrals were used as early as the late 18th century has been noted above. Modern glass and a tin can in the vicinity of Hogan 20 and House 9 suggest recent camping or picnicking, possibly by non-Navajo sheepmen, tourists, Civilian Conservation Corps workers or archeologists.

Seasonal use for farming is documented ethnographically for Cluster IV. The association of Granary 20 with Cluster II and Granary 21 with Cluster III is suggestive of similar occupation during the growing season. In addition to the possible snow melting feature south of Cluster II, the recovery of a few pinyon nut shells shows at least some presence of people on the site later in the season. Whether this presence was merely the result of visits made from winter quarters to get corn from the granaries or year-round occupation is uncertain. It is worth noting that while no concealed granary was found near Cluster I, the Cluster II and III granaries are well hidden, perhaps evidence that they were left unattended for extended periods, probably while the owners were at winter camps at some distance from their farm. Large sandstone slabs near the entires of some structures may well have been used to help close them when all occupants were absent.

Dwelling orientations suggest most construction was during spring, summer or fall. None but House 9 is oriented so far to the north as to make a sunrise orientation impossible. The special nature of House 9 is suggestive of the use of ceremonial reversal because of the dangerous activities with which it was associated (Reichard, 1950).

Thus, with the possible exception of the puebloid structures in Cluster I, seasonal use during the summer for farming and sporadic winter visits would appear most probable.

The distributions of materials about the site suggest activity areas somewhat similar to those observed in traditional Navajo culture, as well as possible differences. Most hogans and houses and the pueblito served primarily as dwellings and in some cases secondarily as fortifications. House 9 may have had defense as its primary function. All probably served religious functions on occasion, but evidence of ceremonial usage is generally rather equivocal except for the straight pipe from Hogan 10. Hematite is used as pigment in both ritual and secular contexts, for example. The secondary central hearths at Hogan 8 might be explained in more than one way even though temporary placement to meet the requirements of dogma seems the most probable.

Granaries, corrals and other features generally served rather self-evident purposes, but may have had auxiliary functions not now readily apparent.

Ash heaps served for the disposal of trash as well as ash during the habitation periods at Clusters I and II. Abandoned structures were also used for trash disposal, especially for waste bone from animals killed for food. Both customs are closer to Anasazi-Puebloan usages than to those of traditional Navajo practice. Trash was also scattered elsewhere about the site, however, a good deal apparently dropped where broken, used up or otherwise reduced to the status of trash.

Distribution of this trash and the few artifacts lying in and about the structures gives some hint of spatial divisions in both interior and exterior areas.

TABLE 11 Overall distribution of ceramic, non-ceramic and bone materials with relation to structures.

	DISTRIBUTIONS		
Provenience	**Ceramic**	**Non-Ceramic**	**Bone**
Quad 1	9	9	6
Quad 2	—	35	4
Quad 3	132	4	19
Quad 4	120	45	295
Ash Heaps	124	27	494
Quads 5 & 9	25	68	66
Quads 6 & 10	25	22	78
Quads 7 & 11	55	39	178
Quads 8 & 12	82	19	60

Bone and in some cases projectile points to the northeast of dwellings suggest that butchering was frequently accomplished outside in this direction. It is likely that, as today, during bad weather butchering was sometimes done indoors, but no certain evidence for this was noted.

Objects and features associated with culinary activities, in particular ceramic remains, ground stone artifacts and most wall hearths, were found to concentrate in the northern half of the structures with the greatest concentrations in the northeastern quarter. The one mealing bin, while situated about on the center line of the room in which it was found, was positioned so that the person doing work there would have been in Quadrant 11, a "northwest" quadrant. These distributions are congruent with traditional Navajo practice in which most food preparation is accomplished in the northeastern quarter of the hogan and female observers at ceremonies seated against the north wall.

The exterior distribution of sherds was also primarily to the north of the structures. The possibility that exterior space around a hogan also tended to be divided along the lines of sexual division of labor seems worth considering, although I am not aware of any such tendency in traditional Navajo usage. If this can be postulated, however, it would further suggest that butchering was normally woman's work in the 18th century as it is today.

The distribution of chipped stone, primarily waste chips and casually used flakes, provides a significant contrast. The orientation is toward the rear with the greatest concentrations being in Quadrants 6 and 10, the "southwest" quarters of dwellings.

This may correlate in part with the religious usage of male participants and observers, other than patients, being seated on the south side of the hogan during ceremonies. The overlap of secondary concentration in Quadrants 7 and 11 both of chipped stone and pottery may relate to characteristically female activities such as butchering in which stone cutting tools were used. While the highest interior concentration of waste bone was also in these "northwest" quadrants, most of this was the result of posthabitation deposition, and the distribution cannot be adduced as supporting evidence for the assumption that butchering took place here.

It is of interest to note that the exterior distribution of lithic artifacts and waste materials shows quite heavy concentrations to the northeast and southwest, a pattern that would again fit a division of exterior space along the lines of normal sexual division of labor and traditional ceremonial patterns in the interiors, but in this case, with a rather poorly controlled sample. The southwest exterior quadrant is actually the south side of the hogan in most cases and would be a favorable work area on cool days.

Sexual division of labor is not strict in Navajo culture, at least in recent times. Many tasks are routinely done by either sex and almost any task can be done by a person of the opposite sex from that to which it might be normally assigned if more convenient. Therefore, these indications of a division of space according to activities associated generally with one sex or the other should not be considered to have been too rigid.

A final aspect of adult activity is concerned with the scattering of exterior informal hearths near some of the hogans. Some of these are undoubtedly the result of outdoor activities during habitation while others may have been campfires of visitors using the structures at a later date. Specific functions cannot be assigned to these on the basis of the archeological data. Some were probably used for outdoor cooking, others as bonfires where people present for night time ceremonies could relax while outside, and others may well have had altogether different reasons for their origins. The extremely shallow soil about the hogans prevented the use of cooking pits at these dwellings. Pits for cooking kneel-down bread, sunrise cake, small mammals and the like are to be expected at early Navajo sites, however, and their absence here is more probably due to the shallow bedrock substrate than to cultural changes.

One additional kind of spatial division within the dwellings at this site is the indication of children's activities in Quadrants 5 and 9, the "southeast" quarter of the rooms. Again I do not know the ethnographic data to give confirmation to this as a tribal custom in any context. It is possible that this was idiosyncratic practice in this extended family, but further data are needed, both archeologic and ethnographic.

Ranging beyond the site boundaries for various activities may be inferred with varying degrees of confidence for different endeavors. Farming was probably done in the mouths of the two small side canyons on either side of the bluff as it was done in recent times by modern Navajo occupants of Cluster IV and 29 SJ 1604 (Site L). Stock may have been herded in various directions from the site, but a major concern was that it be kept away from growing crops. This plus the presence of objects probably brought from the higher mesa levels by child herders suggests that grazing was largely at the higher elevations to the southeast.

To Dík'ǫ́ǫ́zhi is thought to have been the principal source of domestic water and possibly of stock water as well, although seeps and pot holes on the mesa may have been utilized for stock whenever they had enough water. Seasonal use of runoff in Chaco Wash and of snowmelt may also have been relied upon to a lesser degree.

Hunting may have been on the mesa for deer and on the grasslands north of Chaco Canyon for antelope, but longer journeys to higher country in the Jemez or the San Mateo Mountains are not unlikely, particularly if the pressure on graze and browse by domestic stock and heavy local hunting had caused a decline in game on the mesa.

The range of the occupants for farms to be planted when spring moisture was insufficient locally and for winter camps is less easily estimated. Traditional Navajo use of winter camps on the Chacra may have great time depth, but more distant moves are easily conceived. The presence of utility pottery of Navajo manufacture but with tempering material from non-local rock suggests the possibilities of trade or wide ranging seasonal movements. In any case, contact of some sort with Navajo areas toward Cebolleta Mesa or Mount Taylor appears very likely.

Nearby defensive retreats suggest that the people could move into hiding for security of families quite quickly and easily. A more extended retreat to even less accessible areas such as the Chuska Mountains or Mount Taylor may have been an alternative under severe pressure, the direction of retreat depending upon the enemy involved.

Population of the site may be estimated, but it must be recognized that the figures are the result of a number of assumptions that cannot be verified. Initial occupation may have been in Hogan 14 on the talus slope by a single nuclear family, allowing an estimate of about four people. The early occupation in Cluster I included the use of at least three dwellings, Houses 2 and 4 and Pueblito 3, with a total of four rooms used for habitation. Each of these rooms has a hearth, so that four nuclear families are indicated if all four chambers were occupied simultaneously. This group of families may logically be presumed to have constituted an extended family, in which case one married couple was probably elderly and without small children, while the other three households would each include one adult child of the senior couple, a spouse and some grandchildren. If an average of two sub-adults per younger couple is assumed for this extended family at its maximum size, a population of 14 may be calculated.

Again, if Cluster II is considered a second generation occupation, perhaps the result of a splitting of the original extended family after the death of the original elderly couple, continued occupation of the pueblito by one of the younger couples would be likely. At least three dwellings exist in Cluster II, House 7, Hogan 8 and Hogan 10 with a total of five habitation rooms.

With the pueblito included, the totals would be four structures with seven rooms. If all three of the second generation families continued to use the site and four of their presumed six offspring brought their spouses to reside here, thus supplying seven nuclear families for the seven rooms, and again assuming an average of two surviving sub-adults for each of the younger third generation couples at any one time, a population of 20 might have been attained. This would appear to have been the time of maximum population during the 18th century.

Hogan 15 and Cluster III pertain to early 19th-century occupation. Whether Hogan 15 is contemporary with the others is uncertain, but in order to be conservative, it will be assumed that it is not. Cluster III includes one rather substantial hogan and three poorly preserved structures that have also been labeled hogans. Again on the assumption that the major dwelling, Hogan 17, was the home of a senior couple and the less elaborate structures occupied by junior couples, a population equivalent to that of the original settlement, about 14, is permitted. Assuming that Hogan 25 and Structure 22 were family dwellings occupied briefly but at about the same time, a final early 19th-century population of six to eight might be justified.

Late 19th-century to early 20th-century occupation of the immediate area seems to have been by Navajo George's family at 29 SJ 1620 where two hogans have been noted. On the basis of generalized data from Navajo tradition, allotment records and historical accounts, the population of this site could have varied from as low as two to as high as eleven at various times, but probably averaged about six, a figure that would be well in line with the calculation presented above for other presumed temporal components.

Later 20th-century occupation was by grandchildren of Navajo George, their rights being based on bilateral rather than strictly matrilineal lines. They occupied two distinct clusters, Cluster IV in the Doll House site and 29 SJ 1604. At least one hogan pertains to this occupation in Cluster IV, while one hogan has been recorded in Site 1604. According to information obtained from the occupants, there were four people living in Cluster IV in the 1920's or 1930's when Hogan 24 was in use, constituting a nuclear family of two adults and two children. There was one family at Site 1604 during this period, but it was another nuclear family and had no fewer than two members and probably included children as well. If two children are assumed rather arbitrarily, a total population of this temporal component would be eight.

Thus, the Navajo population of this portion of Chaco Canyon, which once supported a much larger Anasazi population, seems to have remained relatively small over a long period of time, varying about as follows:

Early 18th Century	4
Mid-18th Century	14
Late 18th Century	20
Early 19th Century (a)	14
Early 19th Century (b)	8
Late 19th, early 20th Century	6 (2-11)
Mid-20th Century	8

Even this small population relied upon a relativley large resource area throughout which it moved according to season, economic needs or other factors, exploiting a diversity of natural resources and social opportunities in order to maintain an acceptable standard of living.

Ethnographic data indicate settlement based on rights through both maternal and paternal lines, but seem always to provide some connection with the Taachii'nii Clan. This can be traced back as far as Navajo George's generation, his wife having been *Táchii'nii.* A direct relationship between the George family settlement and the earlier occupants has not been established, but the temporal gap would not have been so long that clan-based claims to areas would have been forgotten. Thus, a *Táchii'nii* association is at least the most probable one for the 18th and early 19th centuries, particularly in view of the claims made by Navajos that their ancestors returned from Fort Sumner to places they had lived in prior years.

There is so much typological change through time at the site that no way of inferring even a matrilocal residence rule is possible with such a small sampling universe. On the basis of ethnographic data, there is good reason to conclude that the clan system had already been inaugurated, (Brugge, 1968).

Early settlement on the bluff during the 18th century was probably by Navajos who could claim some Pueblo ancestry through the refugees who joined the Navajos during the Reconquest. Through the two or three generations who built dwellings here during the period from the early 18th into the early 19th centuries, the strength of Puebloan elements in architecture diminished steadily. Much of this appears to have been a response to the social environment, first the need for defense from enemies and finally, perhaps, acceptance of the Blessingway teachings no later than during the occupation of Cluster III where Blessingway prayers are suggested by the charcoal X's on the roof on the rockshelter incorporated into Hogan 16, and probably in part as early as the settlement of Cluster I where the scarcity of painted pottery of Navajo origin suggests observance of at least one of the Blessingway prohibitions. If Blessingway and Monsterway are two extremes of an opposed duality that have a shared origin in Navajo theology, as appears not unlikely, House 9 may also be indicative of acceptance of a more encompassing religious complex than just Blessingway itself, but this is quite speculative in the light of our limited knowledge of Monsterway at present. In any case, the residents can be considered basically Navajo rather than "refugee" throughout the sequence of occupation, although descended in part from refugee ancestors. Through the passage of time they came to conform more and more closely to what we today consider traditional Navajo culture.

Contacts may have been maintained with distant Pueblo relatives, however. Any sort of kinship, however remote, would have facilitated trade relationships and evidence of intertribal trade is clearly present in the ceramic remains. Contacts in this trade seem to have been strongest to the south, with Zuni best represented among the Puebloan sources of pottery. Minor amounts of sherds from the Tewa pueblos, Santa Ana, Laguna, Acoma and Hopi indicate widespread points of origin for pottery, however. Direct evidence of glass beads and metal chain, as well as indirect evidence in the bone for metal knives and axes, might also reflect trade with Pueblo peoples, but could just as easily be indicative of trade with the New Mexicans of Spanish cultural heritage.

Despite the broad area from which manufactured goods were obtained, lithic remains tend to be largely of local materials, perhaps the outcome of the availability of metal tools and a concomitant lessening of interest in stone as a substance. The few exotic mineral specimens do represent a rather wide geographic extent, from Polvadera Peak and the southern Jemez Mountains on the east to Washington Pass and Arizona on the west and from the San Mateo Mountains and Prewitt on the south to perhaps as far north as the San Juan River. All of these materials are either from within the Navajo country as it probably existed at this time or within areas to which Navajos had access for materials and do not necessarily indicate intertribal trade, but more probably intratribal exchange or collection from the deposits by the site occupants themselves. The one other probable import, peaches, may also have come via intratribal exchange, but this remains quite uncertain.

Products which the site's inhabitants might have had for trade may be inferred to some degree. Most, on the basis of the archeological data, likely would be sheep, mutton and wool or woolen goods. The small number of bones of large game in most deposits suggests that buckskin might not have been in sufficient supply during most of the early use of the site to have been a major trade item. But, the proportions of bones could well be misleading if much of the butchering were done in hunting camps or most hunting done after movement to winter camps. The one awl suggests either basket making or work in buckskin. All of these items, with the exception of raw wool, are mentioned in accounts of Navajo trade written prior to the Fort Sumner exile.

Materials recovered do not appear to be adequate for quantification in such a way as to reveal the relative importance of various economic pursuits, but some estimates may be made, keeping in mind that the identification of special use sites at a distance, and of winter camps associated with these occupations are quite tentative except for the two latest of the temporal components.

Agricultural storage space is greatest for Cluster II, although it is entirely possible that Granary 20 was also utilized during the earlier Cluster I occupation. If both chambers of this granary were already in use this early, the space available to store corn became smaller in relation to population as time passed. Granary 21 in Cluster III is sufficiently smaller that a lessening of reliance on agriculture may again be indicated. No agricultural storage areas have been identified for the post-Fort Sumner occupations, but further ethnographic inquiry might reveal such facilities. It is possible that the later occupants made use of the old granaries or that they excavated storage pits that would not be identifiable on the surface today. By 1930, however, overpopulation had become a problem in the area and distribution through kin channels or sales might have been so rapid after harvest that specialized storage structures would not be required except in the unlikely event of a bumper crop, most corn probably being used in the green stage. Implements for the preparation of mature corn such as manos, metates and piki stones, are lacking in Cluster IV, but without excavation, the comparability of the collections from this cluster with Clusters I and II is poor.

Faunal remains show the importance of pastoralism during the early occupations and corrals are evidence of the same in the latest component, but the two kinds of data are not directly comparable in any quantifiable manner. The Cluster III component is not well enough known to allow for an informal estimate, but the limited data do not indicate a major reliance on livestock. Sheep and goats were obviously the major economic species and were utilized for meat by the early inhabitants. Additional inferred uses for hides and pelts, wool and milk are almost certain. Equine stock, possibly both horses and burros, are indicated by less precise evidence. The only indication of horses in the oldest component suggests use as riding animals. The Hogan 15 component reveals that a dead *Equus* was skined and probably butchered. Wagon parts from Cluster IV again provide evidence of the use of horses, by this time as draft animals. The data obviously are too sparse to permit assurance in reconstructing the full range of uses of either horses or burros without recourse to ethnographic generalizations, much less to provide a base for quantifying the relative importance of the animals during the different time periods represented.

There is also indirect evidence of the presence of dogs in the parts of food animals' bones that remained on the site. A chicken may be indicated by the bone tubes, but the identification is uncertain. Species not revealed to which the earlier occupants had access through neighboring peoples if not within the tribe include cattle, pigs, cats and turkeys. Only the first of these has been reported historically or ethnographically as an important Navajo domesticate, but all are sometimes raised by Navajos today.

Although Navajo tradition indicates the corraling of antelope by the residents of Clusters I and/or II, bones of this species are the least common of the major meat animals represented. Deer bones are not unusually plentiful except in postoccupation deposits. A bias in numbers due to the probable butchering of game animals at locations away from the site makes any evaluation of the importance of hunting impossible, although it obviously made more than a minor contribution to the people's resources, both in diet and in raw materials such as hide and bone. Small game was a distinctly minor resource.

Gathering could hardly have been as insignificant as paucity of remains suggests. Trade and wage labor may be lumped as different aspects of one sort of phenomena. It is readily apparent that the acquisition of durable goods from outside the tribe saw a major increase in the last period, as might be expected. Evidence of both intratribal exchange and external trade appears in the earliest dwellings, however.

The scale of this earlier trade and to what degree it was based on raw materials such as meat and hides, processed materials such as buckskins or finished craft products such as blankets and basketry, cannot be determined.

Certain aspects of trade do not appear to have fit the expected trends, but a number of unknowns are involved. The only trade goods found in the excavations of undisputable Euro-American origin were glass beads. These cannot be classified otherwise than as luxury goods. Puebloan decorated pottery might be considered either a necessity or a luxury depending upon the functions it served. These functions are unknown for the 18th-century Navajo components. Metal knives and axes were in use by the 18th-century occupants. It is certain that the iron from which these were made came from the Spanish colonies, but whether the implements themselves were manufactured by whites, Puebloans or Navajos is not so certain.

Some Navajos may well have possessed sufficient skills at working metal by this time to have produced knives at least, if not axes. The rather low level of work in chipped stone implies that dependence on metal had already developed to a limited degree. Knives and axes are basic tools, not luxuries. The trade for them involved extratribal sources. Metal tools were apparently of extremely high value. None were abandoned for later recovery in the excavations as were lithic and bone tools. Thus the full range of metal goods in the tool kits of the people of the Doll House Site during pre-conquest times is unknown.

The rarity of good chopping, cutting and scraping lithic tools is notable. Metal artifacts had apparently nearly replaced the older stone types. On the other hand, well-made artifacts designed for piercing, such as arrow points, awls and needles, were still present in stone and bone. It would appear that for piercing, the aboriginal materials were preferred or that metal artifacts for this purpose were not as readily available.

Such evidence of customs sanctioned or prescribed by religious tradition as appears suggests some changes. Only two rooms have entry orientations that do not fall within the range of variation of sunrise at Chaco. One is House 9, the structure reputedly associated with war and hunt ceremonies. In theory, this structure should be oriented to the north, but its orientation is about halfway between the summer solstice sunrise and true north. Hogan 15, the odd late hogan built against rocks, is oriented about 22 degrees north of the summer solstice sunrise. The constraints placed on its orientation by the incorporation of the boulders do not appear to have been so severe to have prevented a traditional orientation. Only this structure, which is late in the occupational sequence, lacks both conformity in orientation and any ready explanation that might account for it, although again hunting ritual may be involved.

The building of Puebloan style homes in Cluster I would seem to be sufficient grounds for concluding that the first Navajo residents on the bluff top did not adhere to the teachings of Blessingway. It is uncertain whether any structure used during this initial occupation would have fit sufficiently well the requirements for performance of a Navajo ceremony to have been available for this purpose, at least according to the traditional standards of the 20th century. Certainly by the time Hogans 8 and 10 were built, however, round to polygonal chambers of true hogan style suitable for ceremonial functions in modern terms could have been used for ritual purposes. It is of interest to note that in Hogan 8, the more used hearths were those against the walls, but there had been fires built at least briefly in front-center positions as well. These may be evidence of the performance of ceremonies which required this usage, the women of the households continuing to cook on their accustomed hearths at other times.

Disposal of broken ceramic vessels appears to have varied from random to use of ash dumps for the purpose. Caching the sherds at a distance from the site is not indicated by any finds of such deposits and the rarity of sherds is not so well marked as to suggest this practice until after 1800.

The only dwelling that might have been abandoned as a result of a death, House 7, was purposely avoided in the excavations. No observations that might shed light on 18th-century mortuary customs were therefore possible.

Ritual paraphenalia was limited to two possible examples. The pipe made from a reworked Anasazi dipper handle would certainly appear to have had a religious function, but it does not match the known requirements of any present-day ceremony. The set of four bone tubes is more problematical. Use in ritual or as a part of costume for ritual is a possibility but no more. Lumps of mineral pigments also may have been for esoteric use, but again other uses are possible, particularly for the hematite.

The above interpretations are often general, sometimes vague, and in all cases, tentative. Even where the data are sufficient to demonstrate usages at the Doll House Site, the site represents only a very small fraction of the tribal population and a limited temporal span. Situations true at one such site do not necessarily conform to general tribal practices. It must be presumed that every family had some ideas that were unique, others shared with only a few other families and others that would match those of most of the tribal population. However brief, distorted, or fragmentary the glimpses of early Navajo life presented by the site may be, they still add to our knowledge of the way things were in a manner that expands on the data from history and tradition and help us gain a little better understanding of Navajo cultural history.

Part III

Concluding Remarks

"What it all Means"

The series of projects involved in the Chaco Navajo study allow generalizations in two ways. First, it is possible to provide a somewhat better narrative that describes the cultural history of the people of the region, a history that adds to our total body of knowledge of the past of our species and that may help Navajos achieve a better understanding of their own heritage. Second, a few general principles that seem to have applied to cultural development among the Chaco Navajo may be extracted from the data. These are not stated as universal laws of human history and may not fit well even when viewed against total tribal history, but are theories which can be tested in other situations where they might apply.

Summary of Chaco Navajo History

Even for the Chaco Navajos, a full cultural history, much less a complete general history, remains beyond our capacity. The following summary describes the principal developments as they are now believed to have been, but new data from many sources may require revision of even the most positive statements.

We do not know just when the first Navajos settled in the Chaco drainage. Spanish accounts describe people living west of the northern Pueblos and north of Acoma as early as the 1580's who were almost certainly Navajos (Forbes, 1960). It appears to have been Navajos whose attacks forced the Spanish conquerors of New Mexico to abandon their first capital near the junctions of the Chama River and Rio Grande in favor of Santa Fe (Ibid.). By the 1620's, the Navajos were being distinguished as a separate branch of the Apaches and their country described in general terms that would include the Chaco country (Benavides, 1945), but specific identification of Navajo settlements does not survive in the sparse documentation of the period, nor have we as yet learned to recognize Navajo archeological remains of that early a date, making it impossible to trace tribal history backward in time into prehistory.

Throughout the 17th century, the Navajos engaged in resistance to Spanish occupation and expansion in New Mexico, often with Puebloan patriots as their allies, as did other Apachean tribes (Forbes, 1960; Brugge, 1969). With the success of the Pueblo Revolt of 1680, the Apacheans shared in the victory and ultimately provided refuge for the host of refugees who fled Vargas' Reconquest of the 1690's.

The refugees became expatriates among their hosts. As hopes of repulsing the Spanish advance dwindled, some returned to their own homes, but others elected to remain free of foreign rule and joined the tribes to which they had fled. Many remained among the Navajos, building their homes in the region known as the Dinetah along the Largo, Gobernador and other small canyons tributary to the San Juan River and founding several new clans within the tribe. It was probably refugees from some of the more westerly pueblos who introduced the clan system itself. A varied assortment of traits and complexes of Puebloan, and ultimately Anasazi, origin as well as some Old World customs made their appearance in Navajo country at this time, leading to a cultural development in the Dinetah that has been called the Gobernador Phase by some archeologists and that marks the first stage of the integration of the refugee population into the tribe (Keur, 1944; Hester and Shiner, 1963; Schaafsma, 1963; Hester, 1962; Carlson, 1965; Eddy, 1965; and Wilson and Warren, 1974).

The new cultural adaptations that evolved as a result of this mixture of Athabaskan and Puebloan traditions with some Spanish introductions were extremely successful. The addition of pastoralism and of new crops of Old World and southern Mexican origin to the aboriginal economic base consisting of an agriculture centering on corn, squash, and beans, extensive hunting of large and small game and a gathering complex that exploited a wide variety of wild plant life provided a more dependable and balanced diet. Craft development, particularly in weaving and basketry, advanced to the point that Navajo products were in demand as trade goods. Small settlements with houses, commonly called pueblitos, and forked-pole hogans, proliferated in the Dinetah. The population of the tribe, even augmented by the refugees, was far below that at the time of Spanish contact, both the wars and introduced diseases having brought mortality far in excess of the birthrate. Even so, an early 18th-century description of the Navajo country indicates a vast expanse that takes in the Chaco region in its entirety (Reed, 1941). Archeologically, we cannot yet define the nature of Navajo use or occupancy of the Chaco region in the very early 1700's, but the cultural growth in the Dinetah soon began to spread as peace developed between the Navajos and the whites. The earliest expansion, probably of people from the Dinetah as much as a diffusion of their lifeway to neighboring Navajo bands, appears to have been to Chacra Mesa.

The wars ended about 1716 (Reeve, 1958). Tree-ring dates from the Chacra suggest a beginning construction of pueblito-style architecture about 1720. Big Bead Mesa may also have received immigrants about this time (Keur, 1941), but aside from the great wall, the influence of the architectural traditions of the Dinetah does not appear to have been nearly as strong there as on the Chacra.

The Chacra population was a smaller one than in the Dinetah. Settlement seems to have been less dense and the Puebloan elements in the local tradition were somewhat diluted. Pueblitos, when built, were generally smaller than those along the Largo and Gobernador. Most were in or near side canyons draining the northeast flank of the mesa where agricultural lands were near at hand. Associated hogans usually had stone walls. These appear to have been primarily summer homes. Forked-pole hogans occur more frequently at higher elevations on the mesa and were probably the winter homes of the people who occupied the pueblito-stone hogan farm sites during the agricultural season. More distant moves were probably made when local drought, a good pinyon crop or warfare provided the motivation.

Peace with the Spaniards did not mean an absence of war. Ute and Comanche raids were still to be feared and the pueblitos were fortresses as well as homes (Carlson, 1965). The Chacra population formed a small and relatively remote community in comparison to the more elaborate developments in the Dinetah. Raiders from the north and east seldom penetrated so far into Navajo country when richer settlements lay in their path, nor did Spanish traders and missionaries find this small band worthy of their attention, at least if the absence of mention in the historic documents is a true indication of the frequency with which they were visited. The rather casual defensive precautions exhibited by the sites of this period show that while the residents were not unmindful of the danger of attack, they did not feel so imminent a threat that they were willing to expend great effort preparing for it. While missionary visits would probably have been documented, trade was a private matter and sometimes done illegally. Negative evidence does not necessarily demonstrate ignorance of the settlements by traders of one sort or another. Thus far, however, sites of the mid-to late 1700's have produced relatively few trade items aside from pottery, suggesting that trade contacts probably filtered through the pueblos with little actual Spanish participation.

The people seem to have lived a simplier life than those in the Dinetah. The spectacular pictograph panels found to the northeast (Schaafsma, 1963) are lacking, nor have caches of elaborate ritual paraphernalia such as have been found in the Gobernador region come to light (Hester, 1961; Carlson, 1965; DeHoff, 1977).

Very little decorated Navajo pottery has been collected, and at least part of this was imported; but most painted wares were obtained from Pueblo potters. Even some of the Navajo utility pottery was made elsewhere, although whether by Chacra peoples who ranged into more distant locales or by members of a neighboring band is not entirely certain. The latter seems the more likely on the basis of the rather limited data thus far available.

If the people did not expend a high proportion of their energies in architecture, ceramics or ritual, they do not appear to have been idle. Granaries indicate that their fields produced sufficient corn for storage into the winter and the quantities of sheep and goat bones suggest a successful pastoral economy as well. Apparently early petroglyphs portray deer hunting more often than is usual in the Dinetah, an activity also indicated by deer bones in the archeological remains. Some surplus of goods existed for the trade for Pueblo pottery, a few Euro-American items and perhaps for the products of other Navajo communities. It is presumed that the surplus consisted largely of perishable products, perhaps woolen blankets, basketry and buckskins.

The almost complete abandonment of the Dinetah about 1750 as a result of drought and Ute attacks (Brugge, 1972) had limited effect on the Chacra settlements. There is a suggestion that building slowed about that time, and many of the people may have temporarily moved, but they soon returned and the population was probably not significantly increased or diminished. The emigrants from the Dinetah bypassed the Chacra in search of more sparsely settled country, for sites that can be identified as resulting from the exodus are found generally farther to the south and west (Brugge, 1972).

Even the nativistic religious reformation that initiated drastic changes in the lifeways of the tribe (Brugge, 1963) had little immediate influence locally. The Chacra was out of the way of the tumultuous changes of mid-century. The fusion of Anasazi and Athabaskan traditions into what we know as traditional Navajo culture continued at a slower pace and was more gradual than elsewhere, for the pressures were less extreme and the beginnings of the fusion were already more advanced. Rather than the revivalistic emphasis on the forked-pole hogan in opposition to pueblito architecture, the Chacra people had already accomplished a partial breaking up of the pueblitos into individual homes for each nuclear family, small houses that would rapidly develop into stone hogans. A visiting singer might not approve, but he was no doubt willing to perform curing ceremonies if the hearth were laid in the center of the floor.

Even as Spanish settlers began to move into the valley of the Rio Puerco of the East and perhaps to range their herds as close as the eastern end of the mesa (Reeve, 1959), the Chacra community seems to have been affected but little. The proximity of the colonists may have given a feeling of greater security from Ute raids, and perhaps they found the white settlers a closer market for any surplus blankets or buckskins. There was no great increase in trade if the limited archeological data are representative, however. When in the 1770's the Spaniards shifted their alliance from the Navajos to the Utes, the Navajos quickly expelled the encroaching settlers (Brugge, 1965). Warriors from the Chacra almost certainly took part in the Navajo offensive, and the appearance of the name Chaca on Spanish maps shortly thereafter strongly suggests that retaliatory campaigns penetrated the band's territory. The campaigns appear to have displaced some Navajos, driving several to seek refuge at Laguna and Zuni (Ibid.), but the tribe was able to hold its regained territory. The seeming absence of pueblitos destroyed by attacking troops suggests that the damage inflicted by the enemy was not great in this region. Life seems to have gone on after the war much as it had before. The extension of 18th-century Navajo settlement westward into Chaco Canyon may have been rather late. Whether this might have been due to pressure from the east or merely a natural increase in numbers is not clear, however.

Catastrophe finally struck with the smallpox epidemic of 1781. This plague took a fearful toll of the Pueblo population of New Mexico, but the burial books of the missions reveal only one Navajo who sought baptism when near death during the year (Brugge, 1968). This is enough to show that the disease did spread to the tribe, however, and the high proportion of hogans that appear to have been abandoned due to death during the late 1700's on Chacra Mesa provides grim evidence to support a conclusion that the area suffered its effects. Tree-ring dates drop off rapidly. Population loss may have included both mortality from the epidemic and emigration.

There was no quick recovery from this drop in population if the limited series of tree-ring dates is representative. The move may not have been great, however. The generally somewhat later 18th-century sites at the western end of the mesa and beyond along the lower portions of Chaco Canyon have long since been stripped of their wood. If these were the major areas of settlement at this time, there would be no dates to indicate the fact.

Relations with New Mexico were deteriorating. Although warfare remained rather sporadic, a movement to sites somewhat farther west may have been prudent. As the frequency of hostilities escalated in the 19th century (Brugge, 1968), the region became an increasingly less desirable place to reside. The first three or four decades of the 19th century appear to have seen but little actual settlement, probably with a concomitant increase in use of the natural resources through hunting and gathering. It was probably during this period that some former homesites such as the Doll House Site became base camps for hunting and warfare. The canyon made an easy route to the east to deer hunting grounds on Chacra Mesa and beyond as far as the Jemez Mountains, while the rolling grasslands supported herds of antelope. War parties could readily reach rough country ideal for the guerrilla tactics of raids and retreat by the same route. By 1823 at least, the New Mexicans were traversing the canyon in the opposite direction to strike at Navajo settlements to the west (Vizcarra, 1964), making residence even more precarious. Warriors and travelers, such as headman Narbona's peace delegation in 1841, did continue to make use of the area for camps, however (Brugge, 1979). Poorer Navajo families with little stock who moved frequently could also survive by living at widely scattered locations and well off the main trails as did Hastiin Beyal's family in the 1840's. With a sparse population, the grazing and hunting were both good (Judd, 1954).

A small cluster of tree-ring dates suggests a brief effort at a more permanent settlement in the 1850's, perhaps in response to a belief that the Anglo-American occupation of New Mexico promised a new era of peace. Old ties to the land had not been broken by the removal to safer country, for Navajos still visited the area frequently. The respite from the wars was but a brief interval, ending before the decade was out.

In the 1860's, warfare reached a new intensity. Most families were reduced to poverty and had to seek refuge from marauders wherever they could find hiding places (Brugge, 1968). Some are said to have gathered in the small canyons south of Pueblo Pintado for awhile immediately before they were taken to Fort Sumner, already bereft of herds. Others may well have camped at other out-of-the-way locales within the region.

The Fort Sumner exile, along with the termination of slave raids, did at long last usher in a peace that included all parties in the territory and even some beyond (Brugge, 1968). It was a restless peace, especially at first. Some families returning to their homeland from the Bosque Redondo reoccupied old homes, but others with less trust in the promises of their former enemies spent the first few years in nearby mountain areas, waiting and testing the situation. As raiding rapidly declined, they also returned to former homesites.

An influx of whites, first probably Spanish sheepman and then Anglos with both sheep and cattle, produced in the region east of the reservation an arena of lively competition for grass and water. Other whites built trading posts, however, and welcomed the Navajos as customers. The Indian agents at Fort Defiance frequently went through the motions of trying to restrain the Navajos from settling beyond the reservation boundaries, but their resources were limited and their area of responsibility so vast that they realized quickly that their efforts were futile. When Washingtion in 1884 issued instructions that all off-reservation Indians who had improvements on their lands should be protected in their claims, a Navajo hold on the eastern region was almost assured; but not quite, for there were no more federal officials who could effectively enforce this order than there had been to enforce previous orders to the contrary. For another quarter century, it would be largely through the Navajos' own efforts that they were able to remain on the land (Brugge, 1979).

They had important allies on their side, however. Not only the agent, but the army officers at Fort Wingate favored the Navajo cause and the traders generally tried to retain their customers near their places of business (Ibid.).

In order to more strongly assert their claims to the land, the off-reservation Navajos began to live in houses at a relatively early date in hopes of qualifying as homesteaders. Some of the early houses they acquired from whites or they hired whites to do the building, but they were building their own houses shortly thereafter. Hogans continued in use and the houses probably had relatively little influence on their way of life.

A greater change was brought about by the introduction of wheeled vehicles. These made possible a more sedentary existence, for it was then often easier to transport building materials, fuel and water than to move the entire family. The economic obligations entailed in the ownership and use of wagons probably followed the established patterns of Navajo social structure, but data are lacking.

Of the goods newly available through the trading posts, foodstuffs were among the most important. Again, the effect was probably one of lessening the need for mobility, for in times of scarcity, subsistence could be obtained through the sale of craft products or through credit locally. Wheat flour gained acceptance and Spanish-style bread ovens began to appear at Navajo homesites.

One other commodity, whiskey, was available only through illegal trade. While some trading posts risked legal sanctions by selling it, most seems to have been purchased from itinerant traders or at stores about the periphery of Navajo country. Again our data regarding the social networks involved in its use are too scanty to permit any broad generalizations, but it appears that it was used most by the more progressive Navajos who were also more receptive to other foreign ideas.

Although most Navajos remained small scale producers, a few men built up large herds of livestock, hired others to help care for their animals and probably took the lead in innovation and in the adaptation of introduced elements to Navajo life. The major large owner in the Chaco country appears to have been Navajo George, whose ability to monopolize a large area of range provided a buffer between the smaller Navajo operators who shared the range with him and the encroaching white stockmen.

The earliest white efforts to homestead in the Chaco region were quite short-lived, but a pattern of winter grazing of sheep soon developed. The sheepmen were mostly Spanish-American at first. They ranged their herds at lower elevations in the winter where the Navajos had their summer range. Most Navajos continued to move to winter homes at higher elevations. Thus conflict was probably relatively limited once those attempting to establish permanent ranches had withdrawn, but that there was competition for the range cannot be doubted. Anglo cowboys also had cattle in the country. They tended to range closer to the San Juan, and their efforts to control range there drove the sheepmen south in increasing numbers (Brugge, 1979).

With the excavations at Pueblo Bonito, beginning in 1896 under the sponsorship of the Hyde brothers, two important changes were initiated. Richard Wetherill, who directed much of the work, began to hire Navajos as laborers on the job when his white crew dwindled. Following the excavations of the second season, Wetherill established a small trading post at Pueblo Bonito, the first permanent foothold by whites in the canyon. Wetherill and the Hyde brothers, with their promises of jobs in the excavations, and of trade, seemed even less of a threat than had the Spanish settlers of the previous century. Had they restricted their activities to those two endeavors, they could have fitted into the community well. Wetherill, however, began to acquire stock of his own and to lay claim to certain portions of the range. In addition, he made alliances with other whites who were also desirous of controlling range within the region, including, apparently, Ed Sargent of Chama and the Miera brothers of Cuba (Ibid.).

In 1907, Theodore Roosevelt extended the reservation to the east and south, taking in land as far as the Jicarilla Reservation on the northeast and almost to Torreon on the southeast. Political pressures forced a retraction of the easternmost portion of this extension the following year, that lying just east of the present locations of Nageezi and White Horse Lake. In 1909, S.F. Stacher was appointed by the Indian Service to oversee the affairs of the eastern Navajos. He first established his headquarters at Pueblo Bonito, but friction with Wetherill led him to remove to another location to the south which he called Crownpoint (Ibid.).

Stacher realized that what remained of the eastern reservation was also likely to be cancelled and began an active program to secure allotments for the Navajos of the region both on and off the reservation. By the time the reservation was again restricted to its old eastern boundary in 1911, most Navajos in the Chaco country and neighboring areas had received rights to 160-acre tracts as allotments. These represented only a very small proportion of the total land base, however (Ibid.).

Wetherill was shot by *Chiishch'ilíni' Biye'* in 1910, following a dramatic confrontation with the Navajos. The immediate cause was revenge for the supposed killing of an affinal relative of *Chiishch'ilíni' Biye'*, but there is evidence that relations between the trader and a majority of the members of the Navajo community were badly strained. Rumors that troops were to be sent to retaliate for Wetherill's death led some Navajos to flee to mesatop retreats that had probably served similar functions prior to the cessation of warfare (Ibid.).

Other whites soon replaced Wetherill on the range, the major competitor in the Chaco country being Sargent who had been sending in his *partidarios* with sheep for winter grazing for several years. Stacher's major problem was helping the Navajos protect their land. Navajo owners of large herds such as Navajo George, Delgadito and *Bit'ahnii Ts'ósí* were able, with government help, to lease township blocks of railroad lands, thus reserving major tracks for use by themselves and their neighbors. Additional allotments were made from time to time as well (Ibid.).

Stacher's administration introduced new ideas in several fields. Local meetings with headmen elected by popular vote, Indian courts and finally a formal chapter organization brought greater political unity (Ibid.).

One of the great concerns of the Federal government was the improvement of the people's economic condition. Much effort was expended in helping them develop their stock-raising industry. Three government stockmen were hired, one of whom was stationed at Kimbeto just north of the Chaco. By the end of Stacher's tenure, Monte Lope, a local Navajo, had worked up to this post at the Kimbeto Substation. Development of water by wells and dams was also important, for it allowed use of range but little exploited previously due to lack of water (Ibid.).

Chaco Canyon National Monument was established in 1907. This action had no immediate effect on the Navajo community. By the 1920's, however, a series of large scale archeological excavations by the Smithsonian Institution and the University of New Mexico began to provide regularly scheduled wage work for nearby families each summer. The excavators also did some repair and stabilization of the ruins. A local labor pool of Navajos with experience and skill in the techniques of both kinds of work soon developed. By the 1930's when Park Service and Depression era special programs provided funds for stablization not only on the Chaco ruins, but at other national monuments, the local men who knew the work got the jobs. Gordon Vivian was able to organize a ruins stabilization program with its headquarters in the canyon to take on jobs throughout the Southwest.

The work was very much needed, for the stock reduction programs initiated by John Collier, Commissioner of Indian Affairs under Franklin D. Roosevelt, were especially drastic in the eastern checkerboard area. Collier's promises to regain the lost land on the east were never fulfilled, the opposition of white stockmen and New Mexican politicians being too strong to overcome (Parman, 1976). Navajos were hired to build fences around the monument and were soon expelled from the greater part of the park area. Only in the eastern end of the monument, where Sargent held railroad leases on alternate section, was the monument left temporarily unfenced. Here Sargent was consolidating his hold of lands and building fences of his own. Willie George and other descendants of Navajo George were forced to abandon areas that had once been open range, and some were persuaded to relinquish allotments where surrounding lands were controlled by white ranchers or the Park Service (Brugge, 1979).

The proportion of houses to hogans decreased during the period between the wars. This may reflect a disillusionment with the hope that living like whites would help the Navajos retain their lands and perhaps even a somewhat nativistic reaction to Euro-American culture in general as a result of the conflict over land and stock reduction. Incipient nativistic phenomena were reported for the region during this period. (Aberle, 1966).

The turmoil of stock reduction caused many chapters to lapse due to political discord and a withdrawal of Federal support (Williams, 1970). Old chapter houses were abandoned. The role of Jacob C. Morgan, himself a Navajo from the checkerboard country, was a central one in the Collier era political factionalism (Parman, 1976). Further investigation of political trends during this time in the eastern Navajo country would undoubtedly repay the effort.

World War II brought a virtual abandonment of the monument by the Park Service and a few Navajos temporarily returned to their old homes. Many local Navajos left to join the armed forces or to work in war industries. It was a period of relative prosperity and reduced pressures on the range. The end of the war brought loved ones home, but also a suddenly renewed dependence on local resources that severely strained the Navajo economy throughout the entire tribal territory (Brugge, 1979).

Mineral development in the 1950's supplied new wealth, most of which went into the tribal treasury. The tribe began a program of land purchases. Many of the white ranchers in the checkerboard country were growing old and their children were not interested in carrying on their operations. The tribe bought some of these ranches, including the Sargent Ranch which was purchased in 1958. Some of the smaller tracts so acquired were allowed to revert to open range for the use of the local people, but larger ranches were leased to Navajos who owned large herds so that the tribe could pay the taxes on the lands. The local Navajos, having been restricted to steadily diminishing lands for two or more generations and becoming more dependent on wage work, included few large owners. The Sargent ranch was divided into nine tracts which were leased to six different families, most from outside the local community and some from quite distant communities. Utilization of these fenced tracts has been on an exclusive basis that continues to keep former users of the range outside (Ibid.).

Recently, the major trend seems to be emigration by many of the better educated younger people to jobs in Farmington and beyond, but the local population remains greater than the resources can support. Only the increasing level of education provides hope for the future. The long range prospect is probably for the development of a few large Navajo-operated ranches with a small community of local people whose skills in park operations enables them to find regular employment at the national park, but this will be a long time developing, for few of the residents possess sufficient education to feel comfortable settling permanently in wage work communities far removed from Navajo society. The border towns, such as Farmington and Gallup, can absorb only a fraction of the surplus rural population.

Development of truly Navajo urban centers, while obviously underway at places such as Shiprock, is hampered by political and bureaucratic obstacles, as well as basic cultural conflicts, but may well prove to be the most viable solution.

Since World War II, however, there has been considerable change locally. Houses have regained their popularity and are rapidly replacing hogans while motor vehicles have replaced wagons. Missionary activity has finally penetrated the region, much of the Christian religious activity being carried out by Navajo clergymen. The Native American Church has also gained adherents, although their numbers are not known.

The tribal program for revival of the chapters has effectively stimulated political development, but some of the new chapters are organized with boundaries and chapter house locations differing from those of Stacher's day. Chaco Canyon is no longer a center, but a peripheral location where several chapter boundaries come together, although many of the Chacra Mesa people do belong to one chapter.

The effects of large ranches, school locations and improved routes of travel have undoubtedly influenced the shift in political alignments, as have the boundaries of the land management units established preparatory to reduction. Allotments issued adjacently according to family membership have preserved a settlement pattern based at least in part along kin lines. Clan ties are still viable and provide a basis for the continuation of the older social structure. Exactly how this functions in a situation where rights to use and occupy land are based on an interplay of traditional Navajo values and Anglo-American law is not yet fully understood.

The proposed mineral developments of the region would bring a renewed influx of non-

Navajos and impose severe disruptions on the adaptations currently functioning in the local Navajo communities. Whether the long-range effect would be beneficial or harmful is a question the Navajos face today, but lacking control of surface rights to much of the land and to mineral rights to an even more extensive portion, their abilities to control events are not as great as within the reservation. The probability of political dissension and factionalism of the sort that divided the Navajos during the Depression is high.

Superficial observations suggest that the checkerboard country will follow a more traditional course than in the reservation communities, much as it did during the Roosevelt years. While political factionalism and a surge of evangelical Christianity complete with revival meetings and undercurrents of revitalization needs are strong within the reservation, the off-reservation communities appear to be able to preserve a somewhat greater degree of unity and to find more answers in Navajo religion, perhaps because the threats to their way of life are still more explicitly seen in a white versus Navajo context, but one in which the Navajos have in the long run managed to hold their own despite seemingly overwhelming odds. The difference is one of degree, however, not one of absolutes. The course of future events remains as uncertain as at the time the Navajos returned from Fort Sumner to try their abilities to succeed as members of a foreign society in their old homes outside the reservations's bounds.

Theory

The Navajos occupied the same physical environment as did the Anasazi before them in the Chaco region. While climatic and ecological changes may have had an influence in their differing adaptations, the cultural and social factors have had more profound effects, both on the people of the area and on the country itself. To what degree the theory derived from a consideration of Navajo occupation of the region may be analogous to that applicable to the Anasazi periods is beyond the scope of this study. Still, it appears not unlikely that a testing of at least some of the ideas produced by the Navajo data would be worth the effort.

Most of my conclusions regarding the Navajo occupation are still in the realm of theory. More rigorous testing with a greater data base is necessary, especially for those based on the excavations. I may not like what a new generation of scholars does with my proposals, but I will welcome their efforts.

The theoretical propositions are organized below under the general headings of demography, defense, economy, sociopolitical structure, religion, and climate. These headings are used in a broad sense, sometimes extending their traditional connotations beyond those normally understood. It would be easy to quibble with my choices of terms for headings, but I believe that the definitions supplied will be adequate to explain the system of categorization used.

Demography

Demography is here utilized in a very broad sense to mean the distribution of people in space, whether by numbers alone, by social classes or ethnic groups, by sex and age, whether on a regional scale, according to settlement patterns over long periods of time or within a site according to activity areas with ephemeral and shifting boundaries. This may not find ready reception among demographers, but it does less violence to the term than some examples that have appeared in the anthropological literature such as "the demography of the pig population" which I quote from a source that will remain unidentified.

The initial identifiable Navajo population may be apparent due to either migration or diffusion. I believe that both phenomena were operative, an initial Apachean population that we cannot identify archeologically receiving immigrants from the Largo-Gobernador country who brought traits which we can recognize in the archeological record.

Population density during this period (ca. 1720-1780) was not great and was rather evenly distributed with relation to resources utilized seasonally, near agricultural plots in summer and in sheltered places near firewood and hunting in winter. Migration to areas outside the region was probably resorted to in times of extreme stress, but travel to particular resource areas by small informal task groups (hunting parties, salt expeditions, traders) is believed to have taken place regularly. Temporary journeys by larger groups to exploit sporadic opportunities such as a bumper pinyon crop were also probably not uncommon. Despite this mobility, the Chacra country remained their home base.

The smallpox epidemic of 1781 caused significant mortality and was probably the cause of a shift in home-base territory, either to the western end of the region or to some more distant region yet to be identified. The Chuska-Lukachukai-Carrizo mountain chain is the most probable second choice. In either case, the population decline continued and the Chaco region became primarily a use area with a very small resident population. Principle uses were probably for hunting and gathering and as a base for warfare against the New Mexicans to the east, the sparsely inhabited zone also providing a buffer against invasion. At the height of the wars, it also served as a refuge area. Sites of this period are usually in concealed locations. During the Fort Sumner exile, the region was largely depopulated.

With the establishment of peace, resettlement was probably primarily by families whose ancestral ties could be traced to the 18th-century occupation. Population increase from this initial resettlement was rapid and largely the result of natural increase. A deficiency in the proportion of people born during the final years of war and exile, suggested by later population figures and Navajo tradition, was probably due both to increased infant mortality and slave raiding, but the period was so short, on the order of eight years, that no major generational effect appears in later birthrates.

This later population was augmented by seasonal and permanent immigration by whites, both Spanish-American and Anglo-American. There was vigorous competition among the three ethnic divisions for control of resources, but no large areas of exclusive white use developed at first. Overlapping and mingling of use and settlement became a chronic condition. In time, white ranches did tend to cluster in certain areas, however. Navajo sites were widespread in many environmental situations, but reoccupation of sites of the previous period during times of stress can be shown.

Since World War II, the major demographic forces have been for a reversion of Navajo control and occupation of rural areas and a concentration of white occupation in special purpose centers, such as the national park, the Federal administrative and school centers and trading posts along the highways. Most whites are present due to possession of specialized skills, and few are native to the area. In addition, however, emigration of surplus population to urban centers outside the region has been by the better-educated younger people of both races. Seasonal migration for wage work in rural areas has characterized the adaptation of many Navajos who lack both sufficient land base to gain a living within the area and sufficient education in Anglo-American culture to adjust easily to long-term settlement outside Navajo country. An increasing number of professional level jobs are being filled by qualified Navajos, however, so that the population drain should not deprive the local Navajos of capable leadership.

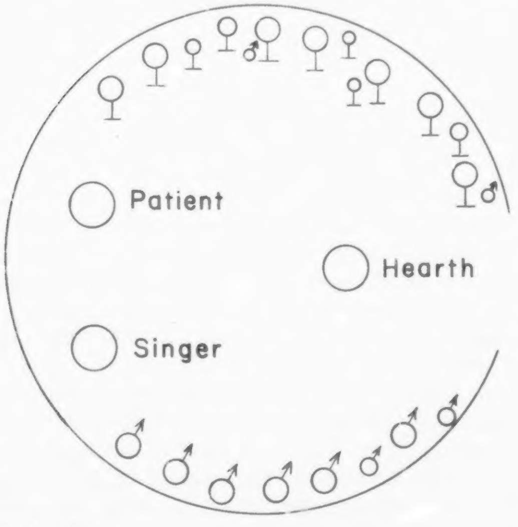
It is apparent that ecological factors have not been the only forces affecting gross population changes, but that political, social, and economic causes within extra-regional networks have often been the most decisive influences. War and the threat of war, cultural orientations, land rights, and numerous other phenomena have helped to determine the number of people within the area at any particular time and their distribution on the landscape.

The definition of what constitutes a site in Navajo archeology is more difficult than in Anasazi archeology. Hogans are variably spread and true contemporaneity impossible to assess without ethnographic data of a sort that can be obtained only from the former occupants. The relationships of occupations that are distinct in time but that overlap in space are uncertain, but the use of the component concept to define clusters of differing ages does at least permit the identification of logical units for analysis.

All sites, except those used for communal hunting, major ceremonies and political gatherings which had very short periods of use, seem to have been occupied by groups no larger than extended families. Certain structures, such as pueblitos and double hogans, were probably the homes of two or more nuclear families. It is assumed that most one-room structures, whether hogans or houses, normally were intended for single nuclear families. Single adults probably varied between sharing a single room with a related nuclear family and inhabiting hogans of their own.

Activity areas within and around hogans suggest the presence of adults of both sexes as well as children in hogans, but it must be kept in mind that the sexual division of labor is not as rigid in traditional Navajo society as in some cultures. The standard division of hogan space for ritual performances, however, seems to relate in a general way to interior activity areas.

During the performance of rituals, most male observers are seated on the south side of the hogan along the wall. The singer is in the southwest quadrant at the end of the area for the male congregation, often with an assistant or apprentice on his right. The patient is seated in the northwest quadrant, along with any co-patients, or the patient's mother should the patient be an infant. Female observers and younger children are seated along the north wall of the hogan to the left of the patient. The singer is usually male, but women past the age of menopause may also be singers. The patient may, of course, be of either sex. For certain rites, such as treatment on a sandpainting, the patient may be seated near the center of the hogan, usually a little toward the rear from the exact center. The singer must move about to perform certain of his duties and others may also have to occupy other locations in the course of assisting with the ritual or practical affairs of the performance, but the above describes the locations of most participants during the greater part of the time while rites are actively in progress (fig. 103). During preparations for ritual activity, such as the making of a sandpainting, the costuming of performers and the like, various other arrangements are observed, but whether these are formally prescribed, I cannot say. Certain preparatory tasks, such as the grinding of pigments and the costuming of performers, have taken place in the northeastern quadrant in the cases I have observed, but the instances on which I base my observations are too few to provide a reliable sample, and I lack ethnographic statements by singers who would know whether these are standardized locations for such activities. Other preparations often take place in the singer's quadrant, but again I cannot assert with certainty that this is routine.



Curing rites.

It will be seen that the quadrant division used in excavations does not correspond exactly to the ceremonial division of space, but that the approximation is sufficiently close that were we looking for the ceremonial traces, assuming survival of such ephemeral elements, they would appear with significant distributions by quad. The most important division would seem to be that between the south half where most of those present are male and the north half where most are female. The presence of the two most important people in the ceremony, the singer and the patient, toward the rear adds another dimension worth keeping in mind, however.

Secular use of the hogan in the traditional Navajo pattern relates in a general way to the ceremonial divisions described above. Culinary pursuits are usually on the north and seem to be more concentrated in the northeast quadrant than the northwest for actual working, while preparatory activities such as grinding corn may not be quite so limited. Men tend to remain in the south half of the hogan for most activities. The rear of the hogan is considered a place of importance where the head of the household or an honored guest might be expected to be seated in formal situations. Variation is common, however, and a loom might be set up inside on the south side of the structure for reasons of convenience or a family with a composition other than that of a typical nuclear family might make unique divisions to meet its needs. The use of older hogans for eldery single dependents or the older boys of a large family might permit the most usual patterns to prevail in one hogan but result in idiosyncratic usage in the other.

Despite these complications, the dwellings excavated at the Doll House Site suggest a division of interior space similar to that noted ethnographically. The least definite indications were those that older children may have had an association with the southeast quadrant, or perhaps older boys only. Male related items, insofar as they may be inferred, tended to be in the southwest, and culinary items, pottery in particular, in the north. The sample is far too small for any final conclusion, but presents interesting potential for further testing.

Exterior space around a dwelling is less well categorized by the more limited data, but also seems to provide a pattern. While the area to the southeast of the entry sometimes produced exterior hearths, too little artifactual material was recovered to define activities. Casual ethnographic observation of my own would indicate both bonfires and some cooking, but these lack any systematic effort to permit conclusions as to a regular patterning. Lithic materials to the southwest of the structures were sufficiently common that male-oriented activities appear most likely. To the north, ceramic deposits were unusually plentiful. Hearths to the northeast of entries were found, as well as lithic material and bone in quantities that suggest butchering in this direction, but usually at a greater distance from the hogan than is common today. Finally, of course, is the location of the ash heap to the east, normally a little to the left of a line directly out the entry but subject to some variation. Only this last feature can be considered to be well established as a usage that is similar in location from the 18th century to the present.

A general principle of functional division of space both inside and outside the dwelling does seem to pertain. Details of this division of activity areas at different time levels need further research. Environmental factors that might be considered significant would be limited to wind direction and solar phenomena—direction of sunrise and the warm or cool side of the dwelling at a particular time of day in relation to any customary time of day for particular activities and seasons of occupation. These can account for particular locations in part, but historic factors can be cited for others.

The location of the ash heap is not too different from that of the trash heap at Anasazi sites and would seem to derive ultimately from the Puebloan tradition. While it may have functional advantage, it also has supernatural sanction. The importance of the rear of the dwelling has a correlate with a similar belief among the Tlingit, also a Na-Dene people, suggesting that this custom has great time depth among not only the Athabaskans, but perhaps all Na-Dene speaking people (de Laguna, 1972). Most important, however, is probably the social reason given by Kluckhohn and Leighton (1962), the facilitation of living by a number of people in a limited space in such a way that minor conflicts are avoided. The composition of the group occupying the dwelling probably becomes the controlling factor in specific cases as to what way and how closely there is conformity to the general pattern.

The distribution of dwellings and other structures within a site is in part a function of topography. Spacing does vary, however, and seems to be greater in more recent sites, but this is difficult to quantify when the absolute contemporaneity of various structures is difficult to establish. Modern Navajo homesites with dwellings quite closely clustered can be easily found while the spacing of the dwellings in the two earliest components at the Doll House Site varies considerably. The social inter-relationships between different nuclear families can be advanced to explain the seeming lack of patterning if it is assumed that all dwellings in a component were occupied at one time, as was done in estimating site population at various time levels for the Doll House Site. Cultural influences can also be considered reasonable alternatives, in particular the strength or weakness of the Puebloan tradition in a particular situation. A further possibility is the suitability of any particular distribution to the needs of safety in the event of enemy attack. All three interpretations have probably had an influence in the matter. Further research to define the actual distribution of dwellings relative to each other and to the terrain within a site would undoubtedly be productive, especially should our techniques for temporal control be refined to the point where it becomes possible to make reliable estimates of the contemporaneity of the scattered dwellings on a site.

Defense

Defense is used here to relate to all conditions imposed by the possibility of hostile confrontations with peoples not of the tribe, whether in actual warfare or in minor arguments. It includes both provisions for the safety of family and property in the event of attack and for retaliation against an enemy for real or presumed damages.

Warfare was a fact of life during the 18th and most of the 19th centuries for the Navajos. When at peace with the whites, there were still Indians of other tribes who presented a threat. The threats from these two sources were not identical, for most Indian attacks were in the nature of hit and run raids and most white attacks involved invasion of Navajo territory by large bodies of well organized and well provisioned troops.

Sites occupied during the mid-18th century, when the tribe was at peace with Spain but suffering attacks by Utes and Comanches, show a limited concern for defense except for defensive retreats where numbers of people could gather in well fortified spots. Most habitation sites are on elevated ground and some are provided with minor defensive features such as loopholes and parapets, but would still have been quite vulnerable to a determined or well planned assault. It would appear that the danger of attack here was much less than in the Dinetah. The people scaled their investment in defensive works in proportion to their estimates of the probability of a raid and its strength. Defensive retreats were small and usually not very elaborate, the most complex found being that in Rafael's Rincon.

In dealing with Indian enemies, it would appear that the Navajos depended not only on defensive works, but also on the ability of their warriors to discover the approach of hostile parties, to spread the word so that families and stock could be placed in safety, and to repel attack. The degree of fortification depended on the degree to which danger was perceived. A relatively vulnerable habitation site is not evidence of a lack of warfare, but of a confidence that the dangers could be contained by less drastic measures that would not disrupt other normal and vital activities. It is probable that during periods when raids might be anticipated lookouts were stationed to watch for enemies and smoke signals utilized to warn of any war parties seen. These would leave little in the way of archeological remains, however.

A similar use of lookouts would have been required by the tactics adopted as warfare with the whites resumed and gradually escalated. Organized armies presented a more formidable opposition than did raiding parties, but could also be more easily evaded. A sparse and scattered settlement pattern with most habitation well hidden in rough country plus a high degree of mobility, particularly if the dispersed family groups could be kept informed of the enemy's movements, provided the best defense. Warriors could not face the invading force on equal terms, but they could harass it by attacking stragglers and scouting parties, running off horses and the like. Disasters came only when troops succeeded in surprising an unwarned camp or the army discovered the hiding places of families and herds.

The historic documentation amply describes these guerilla tactics with indications that they were improved with experience. Navajo success in dealing with armed incursions was never perfected, however, and offensive operations were by far the most effective tactics for both sides in warfare between the tribe and the whites (Brugge, 1968).

The vulnerability of regions close to the enemy and the value of a buffer zone through which invaders must pass may have been explicitly recognized or may have become apparent as the dangers of living close to potential and unpredictable enemies led to many of those in exposed locations retreating to the security of areas more distant from the enemy's country. In any case, the Chaco region seems to have become a buffer zone for the Navajos during the more intense wars that developed during the early to mid-19th century. Political factors became the dominant force in determining settlement pattern within the region. Lessened pressure on resources made it possible for the sparse population to move with relative freedom to such locales as they desired or had to enter for security. At least one site continued to function as a way station or staging area for hunting and war parties on their way to country to the east.

The fewer constraints imposed by anticipated attack following the return from Fort Sumner allowed for habitation in diverse environments. Refuge areas in rough country, sometimes still useful for seasonal grazing or hunting, were maintained, and on occasion, used as retreats in times of extreme stress; but Navajos also established homesites in open country where they felt sufficient confidence in their safety that they were in time willing to oppose whites in threatening situations at their homes. This new confidence may not have been entirely a result of faith in the political stability that peace brought, although it was certainly the critical factor. The fact that they were at last on an equal footing in terms of weapons with their adversaries certainly had influence also. As long as the army were not sent against them, they had to contend only with small parties of cowboys and sheepmen whose arms and organization were about on a par with their own, neither side having the moral support of the Federal government to engage in hostilities.

Economy

Economy was intimately tied to the ecology of the area throughout the earlier part of the period under study and did not significantly diverge from a reliance on natural phenomena until close to the end of the 19th century. Access to natural resources such as farmland, grazing, water and fuel has continued to be important for most families down to the present.

Trade was on a sufficiently low level during the 18th century that it did not influence settlement locations. Trading expeditions were probably made with the use of both saddle and pack animals. While luxuries and utilitarian goods were traded in both directions, the quantities and low urgency of demand were such that trading at infrequent intervals over great distances could easily satisfy needs. Even at this early date, however, the production of goods for trade was an important activity.

Despite the rise of warfare with the whites, illicit trade continued into the 19th century, but its very nature has made it difficult to learn much about it. It probably remained of marginal economic importance, however, for few trade goods appear on archeological sites of the period.

The beginnings of trading posts in the 1870's and their proliferation following the extension of railroads into New Mexico opened new opportunities. Craft work, particularly weaving, could now make a major contribution to family subsistence. Manufactures have continued to be produced on a "cottage industry" basis by part-time specialists working at their homes. Steadily improving transportation in terms of vehicles and roads have made the locational factor unimportant insofar as homesites are concerned, at least in the case of weaving. The needs of the sheep were more significant in determining residence than the market for their products, whether raw wool and pelts or finished rugs. Silversmithing was practiced in the Chaco region, but seems never to have developed as a major economic endeavor, largely perhaps because this craft is dependent for raw materials on imports. Whatever the causes, silverwork has long centered on Gallup which became a source of supply for silver and turquoise (Adair, 1944).

In the long run, wage work became the more important aspect of the economy that the use of cash at trading posts permitted. Both crafts and wage work began to grow in importance with the initiation of excavations in the Chaco ruins and development of trading posts by the Hyde Exploring Expedition. The necessity of daily presence on the job during the various excavation projects seems to have influenced a shift in settlement toward the west end of the canyon where most of the major ruins are located. No urbanizing tendencies emerged from this, however. Even this work remained secondary to agricultural and pastoral portions of the economy, and a scattered rural settlement pattern remained the mode. Wage work has remained for most Chaco Navajos an uncertain, even capricious, source of income controlled largely by outsiders. Although it has now come to contribute far more to total personal income within the tribe, it cannot provide the security that can a herd of sheep (Aberle 1966: 82,87-88). With improved modes of transportation, it has become increasingly easy for a man to live well out on the range yet work at his job with an acceptable degree of regularity. Even when an individual lacks access to modern transportation, he is often willing to make almost heroic efforts to commute to a paying job, at least temporarily, while living at a distance. The archeological data do not encompass a sufficiently wide area nor sufficiently recent sites to show the present trend of Navajo settlement to include urbanizing centers near sources of jobs and services.

One final note with regard to the resources near which Navajos have tried to locate their dwellings should be made. Throughout most of the temporal span covered by the present study, firewood hauled by humans or pack animals was the only source of fuel. The proximity of winter homesites to wood was a vital consideration. Wagons relieved this necessity to some degree and the use of coal finally made regular winter occupation of some treeless areas still less difficult. Wagons and coal may have been nearly as important in the expansion of settlement, at least on a year-round basis, into the grasslands as was political stability. Bottled gas for stoves has recently made the constraints even less and has had an unexpected side effect, the disappearance of ash heaps as a feature in association with many modern Navajo dwellings.

Sociopolitical Structure

Sociopolitical structure has produced factors that have been among the most influential in Navajo settlement patterns. Despite having been agricultural for at least four centuries, having possessed economic livestock for nearly three centuries and practiced crafts for the manufacture of trade items at least as long, the failure of towns to develop among them is of particular interest. Strong Puebloan influence led to a few pueblitos of village size (Carlson, 1965) and a rather remarkable aggregation of hogans on Big Bead Mesa (Keur, 1941). The trends did not continue, however, and neither pueblos of compact construction nor more open towns of individual homes appeared. Examples of both styles of urban phenomena were readily at hand and the refugees even brought with them an insider's knowledge of town life during the Reconquest.

Nearly all known Navajo habitation sites can best be interpreted as the homes of nuclear or extended families. Only since World War II has any significant Navajo urban settlement been noted and this invariably at centers founded by non-Navajos. Population densitites great enough to permit the formation of towns have certainly not been lacking. Alternative solutions to the problems of defense and access to resources were available. While religious sanctions might have hindered the growth of pueblos, they did not prohibit other town plans. Once peace was firmly imposed, towns would have seemed almost inevitable.

Obviously, urban centers had no place in the Navajo way of life. Every extended family was nearly self-sufficient, at least as an economic unit, and nuclear families often were as well. Even the individual was able to exist for relatively extended periods very much on his own. Although uncommon, households with only one member have been noted from time to time among the Navajos (Adams 1963; Shepardson and Hammond, 1970), and both Navajo tradition and historical documentation indicate that this tendency has some historical depth.

Such determined individualism does not seem to be characteristic of most tribal societies, but data are not really adequate to generalize extensively. The ability of the nuclear family, at least, to survive long periods of isolation from other members of the society is not uncommon, however, among tribal people.

Under such circumstances, the advantages of town life might not be self-evident. The lack of necessity is not sufficient to block invention if some advantage can be perceived. Observation of towns among their neighbors and experience with the incipient villages that are known had no noticeable effect, however.

In my view, the critical factor was the absence of the social and political mechanisms that must exist to regulate town life if the community is to survive. The egalitarian, nearly classless, social structure and high respect for the individual's right to make decisions did not lend themselves to the rapid formation of authority roles and structured organizations such as close community living demands.

The above may appear a rather simple conclusion, but I believe that it does provide insight into the slow manner of the development of towns in prehistoric times. Corn, beans, and pottery alone are not enough to bring about the formation of pueblos. Without nearby models to help stimulate town formation, the time required to evolve the sociopolitical structure that is the heart of any urban community must inevitably have been long in duration.

For the Navajos, there were perhaps additional reasons. As heirs to the ideology of the Pueblo Revolt, independence of individual, family and tribe were undoubtedly values not to be lightly relinquished. The functioning of authority above the extended family level has been traditionally very strictly limited except in certain situations where the knowledge of a singer, war leader or other specialist gave clear cut reasons for his power, and this was restricted to the context in which it was functional. Elsewhere, consensus was the rule.

Just what sociopolitical structures governed land rights in the 18th century is uncertain, although the clan system had doubtlessly been instituted. A band system such as existed among other Apachean tribes may well have been still strong, but probably even then on the wane. Chacra Mesa and Chaco Canyon together would have formed a logical area for a single band-like community, but that they did so is no more than a guess. Such a community could provide the basis for many undertakings that would have required mobilization of greater manpower than an extended family could supply, for communal antelope drives, for large parties of warriors to drive off enemies or retaliate against them, for warning sytems against enemy attack and for major ceremonies. Unless clans were unusually large and concentrated in their residence, they could not have effectively performed these functions, but they could have provided extended kin ties that might facilitate cooperative action and help strengthen bonds with neighboring bands.

Assuming the functioning of a matrilocal, matrilineal system based on clan membership, as was probably the case, rights to homesites, farmlands, and possibly certain other resources would have been retained by the extended family at least as long as there were female heirs. Whether the clan claim or the use-rights of a male child would have taken precedence in the absence of daughters or in the case of patrilocal settlement due to the needs of particular families is of course well beyond our ability to infer or to test archeologically, although the latter would be usual today. There is reason to suspect that as many as three generations of one family occupied the Doll House Site, and if there were continuity of descent across the apparent gap in occupation, twice that many; but to assert that each generation was matrilineally descended from the prior one goes far beyond the data presently available.

Whatever the precise structure of the extended family, it would appear to have been the primary land exploiting unit in the 18th century as well as in the late 19th century. Suprafamily organization on the clan or band level with ability to allocate rights to cultivate land was probably not needed in view of the well dispersed population, but such a system cannot be ruled out in view of Pueblo practices.

By the 20th century, Navajo tradition describes the extended family as the major land-use unit and many sites with two or more dwellings would fit this picture. Single hogan sites seem often to have been sheep camps where one nuclear family temporarily resided with the herd of an entire extended family. The elaboration of this system by large stock-holding families for the care of a part of their herds by non-members employed for the purpose did take place, but details are poorly defined in the data, nor has its antiquity been determined. There were wealthy Navajo stockmen long before Fort Sumner. A comparable method may have functioned under aboriginal conditions with use of captives as slaves for part of the manpower needed. Evidence as to the size of herds in the region during the 18th century has not been recovered other than the indications from the Doll House Site that herds were sometimes large enough to permit selection of the mutton for slaughter. Population at the site seems to have always been small enough that a herd of only 200 animals would have been more than enough to meet this need, however.

Religion

Religion can have strong influence on other aspects of culture, both of a conservative nature and as a stimulus for change. Among the Navajos, it has played both roles. Religious activity is often thought of as humanity's method for dealing with those natural phenomena that are beyond direct control. It often exerts more positive forces than the mere magical procedures designed to change weather or cure disease, however. By sanctioning the ways by which people should live, it sets standards to which most will conform. When it bestows its approval on innovations, it facilitates cultural change just as effectively as it inhibits change by limiting its blessings to more traditional customs. Change may be effected by established religious leaders who provide new theological interpretations to fit new situations or by revitalization movements that arise to counter major stresses within a society. Again, both have occured in Navajo history and have made possible a good deal of the flexibility for which the Navajos are noted.

During the first half of the 18th century, the Dinetah was a region of intense religious activity. Rock art ranging from individual small petroglyphs to large complex panels depicting religious subject matter in multicolored murals dominate the scene, while finds of elaborate religious paraphernalia in pueblitos and rock shelters provide evidence of complex ceremonial life. Most of the material shows clear signs of Puebloan origins. It would appear that the heterogenouns refugee population was engaged in efforts to integrate the religions traditions brought from diverse pueblos and to provide religious leadership not only for their own people, but for their Navajo hosts. In addition, the radically changed conditions for their lives made reformation of theologies of utmost importance if the old religions were to meet the needs of the people. The ideology of the Pueblo Revolt had to accommodate to defeat of the Pueblos in their home territory and the success of the Navajos in remaining free. As the refugees themselves became naturalized Navajos, there was also the need to translate most of the religious lore into the Navajo language, if it were to survive at all.

The integration of various Puebloan religious traditions and of the Apachean religion as well culminated in the late 18th century in a revitalization movement based on Blessingway as a unifying ceremony which could give coherence to the whole and which defined in various ways how a Navajo should live. The injunctions regarding a proper Navajo way of life were largely very practical innovations and recombinations of older elements that probably had their origins outside of religious thought, but the moral suasion of dogma and theology made their acceptance by most of the tribe nearly certain. Warfare and drought, as well as internal stresses brought about by the fusion of the Anasazi Puebloan and Athabaskan-Apachean heritages, disposed the people to place their faith in the newly integrated complex, both the prescriptions and proscriptions regarding lifeways and in the supernatural forces that supported them (Brugge, 1963).

This movement did not find universal acceptance among the Navajos all at once. The changes probably had not run their course to completion until about 1800. In the Chaco region, there is evidence that the new teachings were only partially effective in changing the customary ways. The great involvement in religious activity of the Dinetah is not evident in the early remains of the Chaco region. There were probably fewer singers and a greater reliance on singers from other regions for ceremonial functions. The blending of Puebloan and Apachean cultures was more even with less contrast between the two. A more secular orientation and simple ritual seem probable. When the first nativistic reactions and exodus from the Dinetah took place about mid-century, there was a temporary and perhaps partial movement of people out of the stone-walled dwellings along the base of the mesa. There seems to have been no further construction of pueblitos in the area following this, and stone hogans may have been developed from the small stone houses at this time. Central hearths, at least for use during ritual performances, replaced wall hearths. Blessingway does not seem to have dictated Navajo life in an all-pervasive way for the Chacra people, however.

The distress of the Navajos of the region was not as great as that of those from the Dinetah, apparently. The smallpox of 1781 may well have been decisive in their conversion, however. Following this, it is difficult to follow developments as the population seems to have been generally at a low ebb until after the return from Fort Sumner.

Hogans of stone, conforming in other respects to wooden hogans elsewhere, were popular in the post-1868 period as well. Use of houses was revived by some for the purpose of holding the land, and these were utilized as residences. But ceremonies continued to be held in hogans as prescribed by native dogma.

Economic and cultural pressure from the white world did cause violations of religious precepts. The most dramatic was in the work in the Anasazi ruins, disturbing the remains of the alien dead. Wetherill made claims to being able to ward off the evil effects of the prehistoric spirits, but it is most probable that the Navajos had more frequent resort to Enemyway as a ceremony to control the supernatural dangers of their work. Indeed, before their association had ended, they must have used the ceremony to exorcise the influences of Wetherill himself upon their lives. Without doubt, the local singers were able to provide a theological justification for the jobs they needed. Navajos not involved in the excavation and stabilization projects, however, must have viewed their activities with suspicion. Accusations of witchcraft can be postulated with assurance despite the lack of positive data. Chaco is not one of the areas considered especially prone to witchcraft among the Navajos, however (Kluckhohn, 1968). Somehow, the local people seem to have been able to escape excessive suspicion of witchcraft despite their frequent involvement in wage work that would normally bring about such accusations with considerable regularity. They have not escaped entirely the burden of being suspect, as might be expected, and witchcraft stories are as prevalent in the region as elsewhere in Navajo country, but hardly of epidemic proportions.

Perhaps their strict adherence to their own religion has been one factor for stability in the region. Mission efforts have been generally unsuccessful and of short duration until very recently. Disparities in wealth have been minor since the passing of the owners of large herds such as Navajo George and Bit'ahnii Ts'osi early in the century, reducing somewhat the strength of envy as a motive for accusations of witchcraft.

No comprehensive survey of witchcraft beliefs and their influences in the region has been made. The few stories heard during my work covered a wide time range, from perhaps as early as the 18th century to the present. One account of a group of Navajos on Chacra Mesa who were eliminated by their neighbors because they were believed to have been the instigators of numerous deaths may well refer to events during the 1781 smallpox, but I have the story from only one source and have been unable to confirm its details. Another is a simple werewolf story of a sort common throughout the tribe and dating from the Depression. Finally, a young Navajo who has spent a good deal of his childhood in schools away from home told me of his surprise and shock at being subjected to witchcraft allegations by others as a result of his taking a job in the excavations.

In view of the theory of witchcraft as displaced aggression among the Navajos (Kluckhohn, 1968), it may be that the ability of the off-reservation Navajos to compete with whites on relatively equal terms, as compared to the reservation people, has served as a release of aggressive impulses that has helped relieve the tendency to exploit excessively a situation otherwise conducive to manipulation in terms of their belief in black magic.

Religion has not, in any case, been a controlling factor in the Chaco region so much as it has been one responding readily to changes in the people's needs and making adaptations to the changing environment, whether social or ecological, somewhat easier. Despite the recent acceptance of various forms of Christianity by a few, it would appear to be still fulfilling this function as it has for quite a long time and potential dysfunctional facets such as extreme conservatism or witch scares of disruptive proportions have not often developed.

Climate

Climate has not varied excessively during the definable Navajo occupation, but in an environment as marginal for human occupation, and as susceptible to ecological damage as is the Chaco region, relatively minor variations from the norm have the capacity for seriously upsetting human adaptations. When use of the extant resources has been close to the maximum that the country provides under a relatively long period of favorable weather, a drought cannot only undermine abilities of people to survive, but result in loss of natural vegetation and erosion that will impair the land's ability to recover quickly when better conditions return. Thus, it is not only the intensity of variations from the norm that affects the productivity of a region for human occupation, but the duration and the relation of different deviations to each other.

Dendroclimatic variability indicates better than normal conditions during the decades prior to definite sedentary Navajo occupation in the Chacra country, but rather poor years during the succeeding two decades from 1720 to 1740. It is possible that the area was ecologically quite inviting when the immigrants from the Dinetah began to settle along the base of Chacra Mesa. Only the 1740's and 1760's were decades of better than average climatic conditions in the Chaco region during the period of early settlement. Conditions did not improve during the five decades following 1780, but were, if anything, worse, only the 1790's being above average. The years from 1830 to 1859, however, saw marked improvement and it appears to have been during these years that sedentary occupation again increased. Following the final wars and exile of the 1860's, a decade that was only slightly below average, variability was more frequent. The 1870's were somewhat below average, the 1880's somewhat above, the next two decades well below, the next four above, the 1950's being extremely poor, and the 1960's above average (Dean and Robinson, 1977). The Navajo population of the region grew steadily throughout most of the period beginning in 1868 regardless of climatic conditions, the only periods of loss being during World War II when many Navajos were absent in the service or at jobs in wartime industries, and the recent trend to emigration of many of the better educated to seek job opportunities outside Navajo country. Just exactly when this trend began and how much it has lessened the pressure on the resources of the land remains to be determined. Lesser losses due to occasional epidemics seem regularly to have been more than compensated for by births for the periods for which we have sound data.

Survivor cohorts based on age data from the allotment records of 1908-10 do provide a few examples of years for which both poor climatic conditions and low survival match, in particular 1846, 1851, 1861, 1864, 1871 and 1881 (Stokes and Smiley, 1969). The earlier of these years are also during times of war with the whites, however, and there are other years of low tree-ring growth with large survivor cohorts.

The effects of climate on social relations is also worth consideration. It is assumed that bad years for crops and range conditions can lead to increased friction between neighboring ethnic groups. In order to test this question, major incidents in which relations between the Navajos and whites deteriorated have been compared with the tree-ring indices for Pueblito Canyon, Canyon Largo, the Rio Puerco of the East, Chaco Canyon, Rio Grande, and Satans Pass (table 12). For the period of Navajo independence, incidents chosen range from full warfare through more limited hostilities to the failure of an effort to missionize the Navajos, a turning point in the closeness of Navajo-Spanish relations during a long era of peace between the two peoples. Following the subjugation of the tribe, the incidents are restricted to events within the eastern Navajo sphere of a more localized nature and include killings, non-lethal shootings and range disputes.

For events that took place early in a year, the tree-ring index for the preceding year is also given, it being apparent that the effect of climatic stress that could have helped precipitate the event must have preceded rather than followed the incident. Although only tree-ring indices for the eastern Navajo area are included, most of the earlier events were of a general nature that involved all or most of the tribe. Until after the establishment of Fort Defiance, however, it was only the Navajo's eastern frontier that was especially significant in Navajo-white relations. Intertribal wars that related to other borders are ignored. The only instance of hostilities utilized in which whites did not directly participate is the Ute raiding of 1773, but this was instigated by the Spaniards.

In terms of simple totals, the incidents selected took place 13 times in good years, 19 times in years that were generally average or that varied significantly in different localities, and 18 times in years that were poor for vegetative growth. Although this would seem to suggest that environmental stress can lead to social stress, it is far from conclusive and suggests that other variables may play an important role.

The distribution of these associations in time is far from random. From 1680 through 1823, the vast majority of incidents, most of which were characterized by open warfare, took place in poor years. The two major exceptions, which took place in good years, were the Pueblo Revolt and the War for Cebolleta of 1804. The former clearly had important political causes that gave motivation for long-term planning by the Pueblos. The succession of three good years in the Rio Grande leading up to the revolt (Smiley, Stubbs and Bannister, 1853) may have played a significant role in these preparations. The War of 1804 is more enigmatic, but localized drought conditions may have played a role. In any case, the 15 years included in this series include only two good, six average or variable and seven poor. Economic hardship does frequently correlate with interethnic strife during this period.

The escalating wars that begin about 1823 show an entirely different pattern. Productive economic years were the rule for warfare until the final desperate struggle. Of the 20 years listed, fully one-half were good, six about average, and only four poor. This was a period when the trade in Navajo captives had become

TABLE 12 Correlation of tree-ring growth indices for the eastern Navajo country with dated historical events.

KEY TO TABLE 12. ***PC*** **(Pueblitos Canyon) and** ***SP*** **(Satan Press) are from Robinson, personal communication.** ***CL*** **(Canyon Largo),** ***RP*** **(Rio Puerco of the East) and** ***CH*** **(Chaco) are from Stokes and Smiley, 1969.** ***RG*** **(Rio Grande) is from Smiley, Stubbs and Bannister, 1953.**

Year	Event	PC	CL	RP	CH	SP	RG	
1680	Pueblo Revolt	185	160	116	190	145	150	Good
1693	Reconquest Wars	166	133	88	96	175	112	
1696	Revolt of 1696	40	47	101	65	47	33	Drought
1704	Pueblo-Apache Alliance	72	59	75	55	77	72	Drought
1709	Pueblo-Apache Alliance	82	112	92	108	63	79	Drought
1748	Failure of Navajo Missions	23	35	16	11	16	12	Drought
1773	Spanish-Ute Alliance	34	66	50	53	21	43	Drought
1774	Navajo Retaliation	123	94	88	57	87	109	Drought
1803	Year Before War	74	132	121	156	55	91	
1804	War for Cebolleta	97	134	115	171	117	108	Good
1808	Land Disputes	65	117	86	105	86	86	
1818	Melgares' 1st War	77	86	48	58	26	40	Drought
1821	Melgares' 2nd War	167	66	94	96	123	80	
1822	Navajo Retaliation	71	12	28	23	1	23	Drought
1823	Vizcarra's War	22	42	55	69	28	71	Drought
1833	Renewed War	154	184	140	180	142	144	Good
1834	Blas de Hinojos' War	119	123	154	147	171	147	Good
1836	Renewed War	78	97	98	120	113	89	
1837	Continued War	123	137	122	103	169	123	Good
1838	Continued War	146	191	138	155	204	129	Good
1839	Renewed War	184	203	188	212	248	157	Good
1840	Continued War	257	162	196	143	234	149	Good
1843	Renewed War	69	56	103	70	81	86	Drought
1845	Renewed War	71	64	109	70	187	88	
1846	Navajo-Ute Alliance	81	59	98	50	94	84	
1949	Renewed War	113	155	138	—	132	103	Good
1850	Continued War	133	94	121	—	116	87	Good
1856	Raiding	221	158	113	—	197	128	Good
1858	Renewed War	138	130	112	—	123	134	Good
1859	Year Before War	100	100	96	—	93	83	
1860	Renewed War	179	154	106	—	83	92	
1861	Raiding	41	23	48	—	11	54	Drought
1862	Raiding	117	120	79	—	132	58	
1863	Carleton Campaign	75	89	84	—	60	56	Drought
1864	Carleton Campaign	29	28	50	—	48	56	Drought
1876	Navajo killed	43	54	94	—	57	106	Drought
1880	Navajo killed	79	64	22	—	13	43	Drought
1883	Year Before Range Disputes	35	27	74	—	122	93	Drought
1884	Range Disputes	92	80	90	—	158	113	
1885	Range Disputes	86	78	82	—	131	150	Drought
1889	Range Disputes	131	96	108	—	116	118	
1890	Range Disputes	67	47	105	—	90	77	
1909	Navajo killed	103	52	113	—	42	101	
1910	Wetherill killed	86	85	93	—	124	112	
1918	Two traders shot	41	96	48	—	45	116	Drought
1920	Range Disputes	208	203	142	—	199	167	Good
1921	Range Disputes	138	111	88	—	52	174	
1923	Range Disputes	62	66	42	—	101	61	Drought
1924	Navajo shot	111	149	90	—	79	112	
1925	Year Before Killing	70	66	26	—	170	37	Drought
1926	White and Navajo killed	145	100	104	—	29	144	

thoroughly institutionalized in New Mexican society. Good economic conditions might be expected to stimulate this trade and thus warfare. It was clearly a period during which environmental conditions might have had an effect on interethnic relations, but so strongly conditioned by cultural factors that the effect was the opposite of that which might be expected.

Following the return of the Navajos to their own country from exile, with peace imposed by Federal rule, reversion to the earlier pattern is indicated. Of the 16 years listed, only one can be classed as good, eight are average to locally variable, and seven are poor. Again, the stress of poverty was probably a factor in discord between Navajos and whites.

It would appear that the original hypothesis requires modification to the extent that environmental change may lead to change in interethnic relations, but that the direction and nature of change can be strongly conditioned by cultural factors. In addition, it is significant that while these changes may help provoke one sort of relations with one neighboring population, a very different kind of relations may develop with another, as is evidenced by the alliances that were formed in the wars listed. It would appear that climatic variability has done its share to make human history more turbulent, but that it has filled a role quite distinct from simple cause and effect. People, with their long memories of past offenses and favors and remarkable ingenuity for devising new ways of coping with changing conditions, have made culture an intervening force of considerable strength.

Conclusion

This study falls far short of a complete explanation of Navajo culture history by either anthropological or historical standards. Many factors of great importance have been given, but little consideration, some due to lack of data, and some due to lack of such resources as time, energy, and space. Not considered in detail, except in part in the historical section, are the influences of decisions made far from Navajo country in places such as Rome, Madrid, Havana, Mexico City, Durango, Cuidad Chihuahua, Washington, New York, Boston, London and Saint Louis by men who exercised the power, directly or indirectly, to shape in some way the course of the lives of Navajos whom they had never seen and, in many cases, did not even consider in their deliberations. That the workings of other cultures and societies so distant should reach to such an extent is obviously a result of cultural changes in Euro-American societies of a very profound nature. The diffusion of ideas and artifacts has increased exponentially during the centuries of known Navajo history, but even at the earliest periods, they cannot be studied in isolation, either with regard to cultural adaptations or with regard to the events of tribal history. The greatest shortcoming however, will always remain a good knowledge of just what the Navajos were doing among themselves during those early years. Although alternatively stimulated and buffeted by the impacts of environment and foreigners, the essential business of living and carrying on their own ways was based largely on decisions they themselves made, ranging from the simple preference of a mother for one kind of pot over another in which to cook cornmeal mush for her family to the complications of obtaining talented men for leadership in religion, peace, and war. Each such decision contributed to a greater or lesser degree to the history of the tribe, for only to the extent that most such decisions were adaptative could the tribe survive and only to the extent that most were exceptionally good could the tribe really prosper and increase. The cumulative effect of the individual choices, the balance between "right" and "wrong" decisions, if it may be phrased in these terms, is the most important factor in the cultural history of any people. No single solution to any problem is the only possible solution. A clan system or a caste system may be equally good adaptations to the same situation, but if the neighbors of a tribe have a social structure based on clans, the people are far more likely to develop their social structure along lines for which a model exists within their range of observation. Wickiups or a pueblo may provide equally adaptive housing in a particular environmental setting, but the choice will have implications for many other aspects of culture, from food storage to child rearing to defensive strategies, setting limits but also providing new alternatives. When conditions change, more decisions will be required. Sources of ideas will be innovations, traditions, neighboring cultures, and recombinations of ideas derived from any of these.

We cannot in the study of the past actually observe the events that took place. We can examine traces of the results of these events, try to reconstruct the original forms of which these traces are remnants, infer processes that might have brought about the results, and hope for some insights into the happenings themselves. Where people identifiable as the descendants of these we investigate can still be found, we can learn much of value from their present way of life for the researching of the past. Where documents survive that tell something of their history, we can gain further understanding, but only when we take into account the conditions under which the documents were produced. Those written by the people themselves will be the most revealing, those written by others that purport to quote members of the group under study are often very significant, while those written in only the words of peoples of other societies are usually as full of gaps as is the archeological record.

Thus, our knowledge of the past will always be imperfect. We often find it necessary to expend great effort to determine a single and relatively simple fact, only to find that even that fact is far from certain and a poor basis for extending our knowledge to a new area. If our research for knowledge of human history gives us a better perspective for viewing all humanity, the goal is worth the cost, but if the knowledge so gained is used merely to reinforce prejudices already held, the investment in research has been counter productive and maladaptive. As surely as atomic energy or genetic theory, the results of anthropological research can be used for good ends or bad, but in far more subtle ways. Knowledge of our own species is the most important that we can acquire, however, perhaps essential to our survival far beyond the findings of the physical and biological sciences. That some use our theories to sustain activities contrary to our beliefs is not reason to refrain from further research, for those who misuse or misrepresent our work would find justifications for their actions somewhere else if the social sciences did not exist. In the long view, only increasingly better knowledge of ourselves can overcome such attitudes. Our greatest weakness lies in the uncertainties of what we learn, yet to fail to recognize the inconclusiveness of our knowledge and to dogmatically assert our theories as revealed truth places us alongside those who would pervert the results of our work, leading us to distort our own product in our desire to demonstrate its validity. On the other hand, we must give support to our beliefs if they are to have any influence.

To expand on a well-worn metaphor, writings are set loose upon the world like children reared to adulthood, and those who brought them to the stage where they gain an independent existence lose control of their futures. They may take pride in their acceptance or suffer for their failings, but their effects, if any, will ultimately be far beyond their power to change. I will be content if the reports produced as a result of the Chaco Project studies of the Navajos make some contribution to studies of Navajo history and culture and if they supply the basis for further research, pleased if they provide us a better understanding of ourselves, and disappointed should some find ways to utilize them, however slightly, to the detriment of the people studied.

Appendix A

Laboratory of Tree-Ring Research Data Supplied by William J. Robinson

Province	TRL #	Species	Dating		Remarks
			Inside	Outside	
CH-W, Hogan 1	CNM-190	Pinyon	1652±p	- 1890+vv	Fragment
CH-N, Hogan 1	CNM-193	Ponderosa	1561p	- 1829+vv	From Site P
	CNM-194	″	1708p	- 1838+vv	″
	CNM-196	″	1744p	- 1863vv	″
	CNM-195	″	1689p	- 1883+vv	″
	CNM-197	″	1767p	- 1884+vv	″
	CNM-191	″	1723p	- 1906+v	″
CH-T, Hogan 1	CNM-192	″	1615p	- 1868vv	″
	CNM-198	″	1733p	- 1875+vv	″
	CNM-199	″	1839p	- 1921v	″
CH-D9, Hogan 1	CNM-200	Pinyon	1599p	- 1786vv	South side pole
	CNM-202	″	1610p	- 1791+vv	North door pole
	CNM-203	″	1610p	- 1809+vv	South filler log
	CNM-201	″	1726fp	- 1852++G	West chink log
CH-E5, Hogan 1	CNM-207	″	1413p	- 1720vv	North side pole
	CNM-204	″	1621p	- 1745vv	Roof pole
	CNM-205	″	1610p	- 1756+vv	South side pole
	CNM-206	″	1633p	- 1769++vv	North door post
CH-E6, Hogan 1	CNM-209	″	1661p	- 1745vv	North side pole
	CNM-208	″	1655p	- 1778+vv	South fork (?)
Windbreak 2	CNM-210	″	1712p	- 1784vv	South side pole
House 3	CNM-211	″	1646p	- 1747vv	North door post (?)
CH-E7, Hogan 1	CNM-212	″	1622p	- 1772vv	South fork
	CNM-213	″	1648p	- 1778+vv	South side pole
Hogan 4	CNM-214	″	1493p	- 1766+vv	South side pole
Hogan 5	CNM-215	″	1684p	- 1776vv	North side pole
CH-K5, Room 2	CHM-64	″	1562p	- 1722v	3rd viga
	CHM-65	Douglas Fir	1714p	- 1738vG	Roof fragment
	CHM-63	Pinyon	1593p	- 1739+v	2nd viga
Room 3	CHM-66	″	1486p	- 1663vv	Roof fall

Appendix B

Inscriptions With Surnames, Listed Alphabetically.

Name	Date	Home, etc.	Site	Ethnicity
Abila, Louis M.	15 Jan 1917	El Rito, NM	29 SJ 1508	Span.
Aragon, Juan F.	—	—	29, SJ 753	"
Archuleta	13 Jan 1927	—	29 SJ 843	"
"	1928 (?)	—	29 SJ 1201	"
Archuleta, Candido	30 Mar 1908	Parkview, NM	29 SJ 2136	"
Archuleta, Pedro	—	—	29 SJ 600	"
Archuleta, Pedro A.	1924 or 1934	—	29 SJ 964	"
Archuleta, Silviano	—	—	29 SJ 385	"
" "	—	Canjilon, NM	29 SJ 753	"
" "	—	—	29 SJ 1053	"
" "	—	—	29 SJ 1232	"
" "	22 Jan 1897	El Rito, NM	29 SJ 1232	"
(*note:* includes "Pastores de __ obejos")				
" "	13 Jan 1922		29 SJ 2018	"
Atencio, Haskey	—	—	29 SJ 1478	Nav.
Atencio, Jesus M*a*	30 Dec 1921	—	29 SJ 1691	Span.
Atencio, T.	—	—	29 SJ 278	Nav(?)
Bajo, Luis D.	30 Mar(?) 1931	Dulce, NM	A14	Span.
Banks, Charlie	—	—	29 SJ 1275	Anglo
Barbe	1957	—	29 SJ 1566	Anglo(?)
Behler, C.	1858	—	29 SJ 1929	Anglo
Benavides, Jack	Jan 1920	Santa Fe, NM	29 SJ 553	Span.
Blum, E. U.	—	—	29 SJ 1170	Anglo
Bradley, General(sic) Ellsworth H.	1858	3rd Infantry	29 SJ 1917	"
Burke, Chas.	1939	(San?) Francisco	29 SJ 1170	"
Burris, T.	—	—	29 SJ 1170	"
Canale, Donaciano	—	—	29 SJ 2191	Span.
Carnohan	—	—	29 SJ 296	Anglo
Chacon, Benino	11 Jan 1910	El Rito, NM	A15	Span.
(*note:* gives his age as 16 yrs., 9 mos., 25 days)				
Cha__on(sic), Salbador	9 Dec 1916	El Rito, NM	29 SJ 600	Span.
Chavez, Ben	3 Apr 1949	Tierra Amarilla, NM	29 SJ 2027	"
" "	7 Mar 1941	" " "	29 SJ 1229	"
Chavez, Elises	—	—	29 SJ 635	"
Ch(avez), Jose Lolo	—	Polarias(?)	29 SJ 1170	"
Chavez, Lolo	—	—	29 SJ 1170	"
" "	5 Nov 1911(?)	—	29 SJ 1903	"
" "	14 Aug 1917	—	29 SJ 1166	"
Chavez, Manuel	5 Mar 1944(?)	Tierra Amarilla, NM	29 SJ 2148	"
Chavez, Robert	2 Feb 1937	Parkview, NM	29 SJ 2103	Span.

Appendix B–Continued

Inscriptions With Surnames, Listed Alphabetically.

Name	Date	Home, etc.	Site	Ethnicity
Cloud, M.	28 Mar 1912	–	29 SJ 388	Anglo
Cly, Pat	–	–	29 SJ 365	Nav.
" "	–	–	29 SJ 1170	"
Collins, W.	–	–	G3	Anglo
Conner, T. O.	30 Oct 1858	CERMB	29 SJ 1929	"
	(*see* O'Conner below)			
Delfin, Joe	29 Apr 1941	–	29 SJ 514	Span.
Delgado	–	La Punta, NM(?)	29 SJ 943	"
Delgado, Vicente	–	–	A15	"
" "	1917	–	29 SJ 572	"
" "	23 Jan 1938	Chama, NM	A15	Span.
" "	13 Apr 1938	"	A15	"
Dickey, S.	1858	–	29 SJ 1917	Anglo
Gale, C. A.	30 May 1901	–	29 SJ 802	"
Gallegos	–	–	A15	Span.
Gallegos, J. N.	–	Chama, NM	29 SJ 388	Span.
Gallegos, Jeronimo(?)	1915	Chama, NM	29 SJ 2342	"
Gallegos, Jose Ynes	–	Chama, NM	29 SJ 388	"
" " "	–	"	29 SJ 1472	"
Gallo, Sam	1939	–	29 SJ 1910	Span(?)
Garcia	1940(?)	Nambe, NM(?)	29 SJ 636	Tewa(?)
Garcia, Vernardino	4 Jan 1915	–	29 SJ 1472	Span.
" , Bernardino	7(?) Feb 1915	Cuba, NM	29 SJ 1479	"
" "	1915	–	29 SJ 2342	"
Garr(?), Orville	–	–	Sheep Camp Canyon	Anglo
	(*note:* accompanied by a Masonic symbol)			
Gonzalez, L.	–	–	29 SJ 1275	Span.
Griffith, Paul	–	Liberty, NM	29 SJ 1170	Anglo
Grigsby	2 Nov 1911	Moriarty, NM	29 SJ 603	"
	(*note:* "US Survey")			
Grigsby, W. B.	2 Nov 1911	Washington, DC	29 SJ 1170	"
	(*note:* "US Survey")			
Grommet, A. G.	2 Sep 1899	–	29 SJ 388	"
Growley, Willis	1945	–	29 SJ 1620	"
Gurule, Jose Antonio	1894	–	29 SJ 514	Span.
Gutierrez	1907	–	29 SJ 624	"
Gutierrez, E.	15 Mar 1910	–	29 SJ 1170	"
Haines, H. L.	20 Feb 1887	–	29 SJ 1175	Anglo
	(*note:* "Store 10 miles down canyon")			
Hawley, Flo	1926	–	29 SJ 264	"
Haynes, Warren	1897	–	29 SJ 1929	"
Howe	1907	–	29 SJ 1698	"
Howe, E. G.	4 Apr 1907	–	29 SJ 388	"
Huff, Rollo	29 Nov 1906	–	29 SJ 1170	"
Hunt, Thos.	30 Nov 1903	–	29 SJ 553	"
Jaramillo	–	–	29 SJ 221	Span.
John, Kee	BC600	–	29 SJ 388	Nav.
Johnson, L. C.	7 Feb 1912	–	29 SJ 388	Anglo
Knob, N.	Sep 1917	Albuquerque, NM	29 SJ 387	"
Leiba, Delfido	1 Apr 1932	–	G2	Span.
	(*note:* date association uncertain; a 1939 date may belong with this inscription)			
Leiba, Delfido	5 Mar 1944	–	29 SJ 2148	Span.
	(again confused dating, possibly 1932)			
Lente, Jose M.	–	–	29 SJ 554	"
" " "	–	–	29 SJ 918	"

Appendix B—Continued

Inscriptions With Surnames, Listed Alphabetically.

Name	Date	Home, etc.	Site	Ethnicity
Lewis, R.	–	–	29 SJ 1170	Anglo
	(accompanied by brand(?): XL)			
Lobato, Miguel	–	–	29 SJ 875	Span.
Lucero, Francisco	5 Jan 1915	–	29 SJ 1905	″
Lujan	1932	–	29 SJ 1298	″
″	1933	–	29 SJ 296	″
Lujan, Ramos	3 Feb 1933	Santa Fe(?), NM	29 SJ 530	″
″ ″	14 Apr 1933	Santa Fe, NM	29 SJ 2147	″
″ ″	17 Apr 1933	″ ″	F9	″
Lujan, Seledon	–	Santa Fe, NM	29 SJ 600	″
″ ″	2 Feb 1933	″ ″	29 SJ 514	″
Madrid, Navo	15 Jan 1918	–	29 SJ 1479	″
″ ″	9 Jan 1919	–	29 SJ 1517	″
Madrid, Navon	4 Jan 1921	–	29 SJ 641	″
______(?), Navor	19 Feb 1922(?)	–	29 SJ 1597	″
Madrid, Nabor	6 Jan 1925	–	A15	″
Madrid, Pacomio(?)	1955	–	A14	″
Madrid, Sixto	13 May 1920	Chama, NM	29 SJ 802	″
Madril, Sixto	19 May 1920	″ ″	29 SJ 1918	″
Maerstron	1922	–	29 SJ 387	Anglo
Maestas, David	15 Sep 1917	–	29 SJ 387	Span.
Marmon, W. C.	20 Nov 1885	–	G3	Anglo
Martines	–	–	29 SJ 148	Span.
Martinez	–	–	29 SJ 1906	″
Martinez, Cesario	–	–	29 SJ 1172	″
″ ″	8 Feb ____	E.N.N.M.	29 SJ 714	″
″ ″	(accompanied by a cross)			
″ ″	19 Dec 1901	–	29 SJ 558	″
″ ″	14 Feb 1917	–	29 SJ 1479	″
Martinez, Dabi(David?)	2 Apr(?) 1920	–	29 SJ 1903	″
Martinez, J. Donaciano	26 Apr(?) 1917	Tierra Amarilla(?)	29 SJ 530	″
Martines, Enovio	–	–	29 SJ 1648	″
Martines, Noberto	6 Dec 1884	–	29 SJ 677	″
Martinez, Press	–	–	29 SJ 943	″
Martinez, Preciliano	–	–	29 SJ 2018	″
″ ″	–	–	29 SJ 2063	″
″ ″	–	–, NM	29 SJ 2015	″
″ ″	3 Jan(?) 1905(?)	–	29 SJ 600	″
″ ″	190__	Chama, NM	29 SJ 385	″
″ ″	23 Jan 1918	″ ″	29 SJ 2116	″
″ ″	19 Feb 1919	″ ″	29 SJ 1903	″
″ ″	1919	″ ″	19 SJ 1575	″
″ ″	11 Jan 1920	″ ″	29 SJ 660	″
″ ″	3 Jan 1921	″ ″	29 SJ 1166	″
″ ″	12 Jan 1921	–	29 SJ 521	″
Martines, Preciliano	29(?) Nov 1921	Chama, NM	29 SJ 1479	Span.
″ ″	1922	–	29 SJ 1199	″
″ ″	28 Nov 1923	Chama, NM	G4	″
″ ″	1926(?)	″ ″	29 SJ 692	″
Martinez, Thomas	19 Dec 1901	–	29 SJ 982	″
Matteson, S. W.	1899	–	Top of Fajada	Anglo
Maynes, Smith	7 Nov 1858	–	29 SJ 1917	″
McCoy, Benito	–	–	29 SJ 2342	Span(?)
McCoy, J.	–	–	29 SJ 388	Anglo
McDonald, F.	7 Feb 1912	–	29 SJ 388	″
McNitt, Ben	1949	–	29 SJ 1918	″

Appendix B—Continued

Inscriptions With Surnames, Listed Alphabetically.

Name	Date	Home, etc.	Site	Ethnicity
Mestas, Francisco	—	Canjilon, NM	29 SJ 925	Span.
Montano, Jose Leandro	1935(?)	La Puente, NM	29 SJ 2344	"
Montoya	—	—	29 SJ 1201	"
Montoya, Elato(?)	1931	—	29 SJ 2048	"
Montoya, Guillermo	23 Mar 1915	—	29 SJ 1479	"
Montoya, Ramon	22 Dec 1932	Nambe, NM	29 SJ 1514	Tewa(?)
Montoya, Sixto	1919	Rosa(?), NM	29 SJ 1843	Span.
" "	1919	—	29 SJ 889	"
Mortell, J.	1858(?)	—	29 SJ 1917	Anglo
Mrogik(?), Ed.	—	Blough, Pa	29 SJ 2148	"
Nash, Ogden	1948	—	29 SJ 264	"
O'Conner, T.	30 Oct 1858	CE RMR	29 SJ 1929	"
	(Company E, Regiment of Mounted Rifles)			
Pics, Jerry	1953	—	29 SJ 1566	"
Prince, J. C.	2 Nov 1917	—	29 SJ 388	"
Pyle	2 Nov 1911	Moriarty, NM	29 SJ 603	"
	("US Survey")			
Pyle, T. P.	2 Nov 1911	" "	29 SJ 1170	"
	("US Survey")			
Ramos	—	—	29 SJ 1170	Span.
Reis(?), Alton	—	Peru, Indiana	29 SJ 514	Anglo
Rigob, E. U.	—	—	29 SJ 1170	"
Rivera(?), A. B.	1928	—	29 SJ 843	Span.
Roberts, E. O.	6 May 1905	—	29 SJ 1170	Anglo
Roberts, L. B.	—	—	29 SJ 1170	Anglo
Roberts, Murtle	6 May 19____	—	29 SJ 1170	"
Roden, John	Jun 1933	—	29 SJ 1074A	"
Romen(?), Rubel(?)	8 Jan 1924	Pojaque, NM	29 SJ 843	Span(?)
Romero, Rubel	7 May 1926	—	29 SJ 530	Span(?)
Romero, P.M.	18 ____ 1918	—	29 SJ 385	Span.
" "	1923	—	29 SJ 600	"
" "	18 Dec 1923	—	29 SJ 1408	"
	(possibly 25 Dec 1928, difficult to read)			
Salazar, David	—	—	29 SJ 936	"
Salazar, Delpepe(?)	—	—	29 SJ 936	"
Salazar, Gregorio	8 Mar 1916	—	29 SJ 1903	"
Sanchez, Antonio	—	—	Sheep Camp Canyon	"
Sanchez, Antonio	3 Nov 1911	Dixon, NM	29 SJ 603	Span.
	(possibly with U.S. Survey—see Grigsby above)			
Sanchez, Marcos	18 Jan 1936	—	29 SJ 936	"
Sanchez, Ned	11 Jan 1917	—	29 SJ 548	"
Sandoval, J. E.	—	Santa Fe, NM	29 SJ 843	"
Sandoval(?), Nestor	—	—	29 SJ 843	"
Serrano, Medardo	—	—	29 SJ 1903	"
Sheek, Jack	10 Jan 1904	—	29 SJ 1170	Anglo
Starrett, S. E.	1858	—	29 SJ 1929	"
Tack, C. P.	8 May 1911	—	29 SJ 1170	"
Taylor, B. H.	20 Jun 1911	—	29 SJ 2203	"
Taylor, F. H.	20 Jun(?) 1911	—	29 SJ 2203	"
Thomas, ______	1915	—	Sheep Camp Canyon	"
Thompson, John A.	1930	—	29 SJ 600	"
Trujillo, J. A.	16 Feb 1917	Sebolla, NM	29 SJ 1567	Span.
Trujillo, Jose O.	10 May 1939	—	A14	"
Ullibarri	1936	—	29 SJ 2009	"
Ulibarri, Celestino	1936	—	29 SJ 2096	"
" "	15 Jan 1936	La Puente, NM	29 SJ 1817	"

Appendix B—Continued

Inscriptions With Surnames, Listed Alphabetically.

Name	Date	Home, etc.	Site	Ethnicity
Valdes, Antonio	13 Dec 1919	–	29 SJ 1408	"
Valdez, Avelino	14 Apr 1941	Parkview, NM	F9	"
Valdez, Jose	4 Jan 1919	Tierra Amarilla, NM	29 SJ 1193	"
Velarde, Enrique	–	Canjilon, NM	A15	"
Velasquez, Pedro A.	–	–	29 SJ 936	"
Vivian, Guinn	–	–	29 SJ 297	Anglo
Ward	–	Pately, Me(?)	29 SJ 1170	"
Wendt, Irma	–	–	29 SJ 893	"
Werito, Art	3 Nov 194__	–	Sheep Camp Canyon	Nav.
Wero, John	–	–	29 SJ 1106	"
Wetherill, C.	1896	–	29 SJ 1918	Anglo
Whiting, Geo.	–	Philadelphia, PA.	29 SJ 619	"
Wilkinson, Ptk.	18 Jun 1976	–	G1	"
Wingfield, K. E.	26 Sep 1910	–	29 SJ 1170	"
Winsbacher	7 Nov 1858	CoK, 3 Inft	29 SJ 1913	"
Yonellano...(?)	3 Jan 1914	–	29 SJ 235	Span.
	(probably not a correct transcription)			
Yunk	1963	–	29 SJ 1566	Anglo(?)

Appendix C

Navajo Vessels From Chaco, 29 SJ 1613

A. Helene Warren

Two slides were prepared, one each from FS 71 and FS 240, of sherds from two Dinetah Scored vessels (S-225 and S-226, respectively). The results indicate that both were tempered with crushed igneous rock from two sources. The rocks are apparently of volcanic origin and of intermediate composition.

S-225: (FS 241): This vessel is thin walled with shallow, fine striations. The clay is dark brownish gray and appears to be carbon stained internally, either from initial firing or subsequent use. As a result, it is difficult to distinguish temper grains with a stereomicroscope, and the only positive identification is that of clear, vitreous feldspar usually in rhombic form.

Microscopically, the clay is dark reddish brown to dark gray in reflected light and dark reddish black to opaque in crossed polars; fragments are irregular and granular, appearing to have moderate relief in reflected light.

The following minerals were noted in this section, and give some indication of the nature of the rock. However, no classification should be based upon only one slide:

1) Feldspar, usually in euhedral form, although cleavage rhombs also are present. Potash feldspar appears to predominate, with some occurrence of sodic feldspar, constituting 80-85% of the rock fragments.

   The potash feldspar is fresh, transparent, and untwinned; rod perthite inclusions were noted in one fragment. Other inclusions were sparse needle crystallites and liquid-gas inclusions, the latter indicating volcanic origin. One grain showed faint Carlsbad twinning.

   The sodic feldspar could be distinguished primarily by very fine Albite twinning, which also occurred in combination with Carlsbad twinning.

2) Pyroxene, possibly augite, occurred in light yellow green, subhedral prisms with low oblique extinction (10-15%).

3) Rock matrix included fragments of pebbly transparent glass and small fragments of finely vesicular glass. The glass appears as a partially birefringent mosaic in crossed polars, due to mineral inclusions (ca 10%).

The mineral assemblage might be consistent with trachyte; however, more slides to determine mineral ratios and percentage of feldspar ratios need to be made before a more definite identification could be made. I might point out that this rock in no way resembles the trachyte of the Chuska Valley, which has a completely different mineral assemblage and textural habit.

S-226, FS 64: The surface finish of this sherd resembles that of the one above (S-225), although the wall may be about 0.5 mm thicker. The clay body is dark grayish brown, is granular and moderately crumbly.

With a stereomicroscope, clear to slightly icy white feldspar and traces of tiny flakes of silvery gold mica were noted.

Microscopically, fragments of the clay were opaque in crossed polars, but in reflected light had a very distinctive mottling of brown patches on a white or light gray clay. The fragments were irregular to angular and had high relief.

Minerals included:

1. Feldspar, both potash and sodic, with the latter being predominant.

Some of the potash feldspar has a small 2V, indicating sanidine; other grains were untwinned with a large 2V. Most of the feldspar had higher indices of refraction, in the neighborhood 1.55, suggesting oligoclase-andesine. Carlsbad-albite twinning was rare. Characteristic was dark brown to black patches, or lattice staining, of the feldspar grains (80-90%).

2. Pyroxene, perhaps hypersthene, occurred as stubby anhedral prisms; some also with brown patchy coatings. The grains were optically negative, light golden yellow, and with apparent parallel extinction (10-15%).
3. Rock matrix occurred as aggregates of the above minerals.

Tenative classification indicates as intermediate, fine grained, holo-crystalline rock, possibly a monzonite.

The nearest possible source for the rocks above is the Mt. Taylor region, where rocks ranging from rhyolite to basalt are reported, including trachyte.

FS 158. This small vessel was tempered with fine grained sandstone from Ojo Alamo Formation of the Mesa Verde Group. This is a type of sandstone available in the Chaco area, but it was also used in other areas in the San Juan basin. Characteristic are sparse to moderately abundant, angular, light to dark gray chert fragments.

Appendix D

Preliminary Analysis of Faunal Remains from site 29SJ 1613.

Spring 1977 W. B. Gillespie

The purpose of this preliminary examination is to gain a general understanding of the nature and composition of the faunal assemblage from Site 1613. In addition to establishing a basically accurate list of the species present, some specific objectives are the identification of (1) the presence and relative importance of domestic animals (especially sheep), and large game, (2) the presence and importance of smaller animals, (3) indications of butchering techniques, (4) any indication of age structure of the populations (especially sheep), and (5) indications of intra-site variability and possible activity areas within rooms.

In general, the results show that artiodactyl remains make up nearly all of the assemblage with both domestic and game forms present. Domestic sheep (*Ovis aries*) make up a probable majority of the total number of bones although their estimated minimum number of individuals is only slightly greater than the number of deer (*Odocoileus* cf. *hemionus*) present. The deer, however, are largely restricted to one locality (Hogan 8) and represented by far fewer bones. Goats, (*Capra hircus*), horse or ass (*Equus* sp.), and pronghorn (*Antilocapra americana*) are all present in smaller quantities. Smaller animals include desert cottontail (*Sylvilagus audobonii*), black-tailed jackrabbit (*Lepus californicus*), woodrat (*Neotoma* sp.), and kangaroo rat (*Dipodomys ordii*). Of these small animals, only the cottontails are represented by more than two individuals.

Procedures

The methods of analysis in this preliminary examination have involved little more than briefly examining all material, and recording for each provenience unit the identifiable bones and roughly the frequency of unidentifiable fragments. Except for mandibles and maxillary remains the bones were returned to their original bags which in turn have been regrouped by hogan.

After examination of all material from each hogan, a crude estimate of the Minimum Number of Individuals (MNI) was made for each hogan (Table 1). Please note that these are preliminary estimates only, and are subject to change with more thorough examination. MNI figures were based on enumeration of the most common element and consideration of recognizable size/age differences. The minimal excavation unit considered in estimating MNI's was the hogan unit. Thus the assumption is made that two different skeletal elements of the same species and approximately the same age probably represent two individuals if found at different hogans but are not considered indicative of two individuals if found in different proveniences within the same hogan. The only exception is where a large ash heap is present. Here the ash heap and structures were assumed to be independent, possibly an erroneous assumption, but one which tentatively is borne out by the remains. MNI estimates for the whole site are simply a summation of MNI's for all hogan units.

Identification of bones was through comparison with skeletal materials at the Chaco Center and through reference to criteria established in the literature (Boessneck 1969, Hildebrand 1955, Lawrence 1951, and Olsen 1964). Preliminary age determinations were based on criteria suggested by Silver (1969) and Gilbert (1973).

Domestic Animals—sheep and goats.

Sheep and goats comprise nearly half of the site faunal assemblage with somewhere in the neighborhood of 25 individuals represented. Due to the great similarity between most sheep and goat elements, most specimens were simply identified as sheep-goat. Only with elements which are particularly distinctive (eg. metapodia, crania) were specific identifications made. While in other parts of the world criteria have been established for the distinction of most sheep and goat elements (eg. Boessneck 1969), such criteria have not been demonstrated to be applicable in the Southwest (cf. Olsen and Beezley 1076, Olsen 1975). Accordingly, more detailed segregation of sheep and goat bones must await the collection of more comparative material from the Navajo area. On the basis of those few elements which can be distinguished with some confidence (eg. metacarpals, cranial portions), it appears that the majority of the individuals in question are sheep. Accordingly most of the Ovis-Capra category probably represent sheep. There is no doubt, however, that goats are present.

While sheep-goats make up about fifty percent of the total minimum number of individuals for the site, they appear to comprise a much higher proportion of the total number of bones. Since bone counts have not yet been made, this percentage is not well known, but subjectively I would estimate it to be at least ninty percent. This large discrepancy between the percentage of total MNI and total bone count reflects the observation that sheep-goats are represented by more skeletal elements per individual than are other species. This condition most likely is the result of on-site butchering and disposition. As such, no parts of the sheep-goats are being constantly transported away from the site and no skeletal elements are conspicuously absent or lacking.

In contrast, the frequencies of various skeletal elements of the most important game animal, mule deer, are noticeably less consistent. Lower limb bones, in particular, metapodia, are most abundant while axial elements are nearly absent. As noted below, this appears to be the result of butchering of deer away from the site and differential importation of skeletal elements. For example, some fifteen tooth row fragments could be identified as sheep-goat while only two were from deer. Vertebra and ribs appear to follow the same pattern. Although no in-depth attempt at taxomic identification has yet been made for these elements, several observations suggest that they are predominantly of sheep-goats: a) the majority of vertebrae and ribs are from assemblages for which the identifiable elements are sheep-goat; b) proveniences from which the identifiable bones are from deer are nearly lacking in ribs and vertebrae; c) the few identified vertebrae (axis, atlas) were sheep-goat; and d) nearly all of the unidentified vertebrae and ribs are of a size and weight (density) more in keeping with sheep-goats than deer. Thus, it appears that whole carcasses of sheep and goats were present at the site while only portions of deer were returned from the kill site.

Butchering

Many sheep-goats bones show definite skinning and butchering marks and the potential is present for a more detailed study. Nothing was noted to suggest that butchering procedures varied significantly from modern Navajo practices (eg. Binford and Bertram, 1977; Bayhem, 1975). Some preliminary observations are:

—cut marks (knife marks) are found in traditional locations charactistic of nearly all artiodatyl butchering (eg. sides of the astragalus, matepodial condules, distal humerus, etc.);

—closely examined cut marks appear to have been made by metal rather than stone knives (cf. Guilday, Parmalee, and Tanner, 1962);

—the majority of long bones have been purposefully fractured, primarily to expedite the butchering process but also possibly for marrow extraction (cf. Binford and Bertram, 1975);

—several very deep and poorly directed hack marks were noted, primarily on vertebrae and rib-heads, but also at the 'elbow' joints;

—these hack marks are of a depth and sharpness that makes it seem probable they were incurred through use of a metal axe (some vertebrae were cut entirely through diagonally;

—the use of an axe to hack along the vertebral column would coincide with recent descriptions of Navajo sheep butchering (Binford and Bertram 1977);

—hack marks on some of the rib heads show that chopping came from the inside (ventral side) of the chest cavity;

—the expertise of the butchering was frequently marginal, a situation noted as other early historic sites in the Southwest (cf. Olsen, 1975). As Olsen notes, butchering appears to have been accomplished with "less than a surgeon's touch" (1975:49).

Age Structure

Indications of the age structure of the sheep-goats can be gained by examination of states of tooth eruption and the epiphyseal fusion of the long bones. Before discussing the pattern of age at death of the domestic animals, it is important to comment on the reliability of age determination. The age estimate criteria used here have been established from the study of modern domestic sheep (Silver, 1969). However, there is good evidence indicating that modern sheep mature somewhat more quickly than the sheep of two hundred years ago. Accordingly, use of modern sheep age criteria may lead to underestimations of the ages of the Navajo sheep. As such, Silver's (1969:297) figures for semi-wild hill sheep measured in 1790 may be more appropriate. Both sets of estimates are included in the chart below (Table II). Unfortunately, it is not now possible to determine which is more appropriate. Indeed, such a determination may never be made for these early historic Navajo materials.

Employing the criteria established for modern breeds of sheep, it appears that most sheep-goats recovered from the site died between ca. ten months and eighteen months of age. If a single 'prime time' exists, it appears to have been soon after the time the animal became one year old. Using the criteria recorded for the semi-wild hill sheep, the age of death appears to peak late in the second year (18-24 months).

For the purpose of gaining a general notion of what age animals were being killed at the site, the determination of exact chronological age need not be an overwhelming concern. As noted by Bayhem (1975) when it comes to selecting animals for butchering, the 'physiological age' of the animal is a more critical variable than its 'chronological age'. Accordingly, perhaps the best characterization of the age pattern represented at Site 1613 is that nearly full grown but still immature animals make up the bulk of the domestic fauna.

The consistency of this pattern of one-two years of age at death and its representation by both the dental eruption and epiphyseal union date strongly suggests purposeful selection of these animals for butchering. This in turn carries the possible implication that a resident sheep population was present which was large enough to allow choice of animals for butchering. With a small herd one would anticipate an age structure more characteristic of natural deaths (peaks at very young and very old) with human utilization largely directed toward animals dying of natural causes. Mature and late immature animals would be too valuable for the continuance of the herd to have been frequently selected for butchering.

It is interesting to note that this pattern of age selection varies somewhat from that found by Binford and Bertram. At both summer and winter habitations, they noted mostly mature animals (two years of age or more) chosen for butchering. The selection of large immature individuals is, however, comparable to age structure of sheep herds from other parts of the world (cf. Wright and Miller, 1976).

Age data from dental eruption sequences shows only one very young animal (well within its first year) and only one mature animal (probably at least four years of age). The rest are all approximately 10-24 months.

The epiphyseal union data, while not as precise as the dental eruption data, reveals the same basic pattern. The method of analysis illustrated here is a technique suggested by Chaplin (1971). Based on the knowledge that different epiphyses fuse at different ages, it is possible to designate a few critical ages and examine the percentage of fused epiphyses for the pertinent elements. The result is in effect a crude survivorship indicator: fused elements represent animals which lived past the designated age while unfused epiphyses indicate the individual died before reaching that age. Again we have the same problem of modern breeds maturing faster and nutritional levels also have a marked effect on age of epiphyseal closure. But, as noted above, we have recourse to the knowledge that general levels of maturity are indicated (physiological age) even if exact age is in error.

Table III and Figure I illustrate the marked preference for large immature animals. Few young and few mature individuals were killed. It should be noted, however, that sample size here is minimal and that the results are little more than suggestive trends.

A brief comment should be made about determination of seasonality. Since we have a collection of mandibles and maxillae with tooth rows in various states of eruption, one might assume we have a good data base from which to estimate seasonality of occupation. Unfortunately, there are two conditions which greatly limit any such attempts. First, domestic sheep are capable of conceiving and giving birth at any time of the year. Most modern herders restrict births to the spring (March-April) with the aid of simple contraceptive practices (separating the rams, etc.). As documented by Binford and Bertram (1977), this is true of the modern Navajo as well. However, it does not appear to have been true among the pre-twentieth century Navajos, and indeed, introduction of contraceptive practices was one aspect of the grazing reformation policies of the first half of this century. Accordingly, we have no guarantee of a restricted birthing season.

The second difficulty lies in not accurately knowing the ages of dental eruption for the particular sheep populations in question. As can be seen above (Table II), a critical difference in any ascription of seasonality derives from whether one utilizes modern sheep data or age criteria from the late 18th century.

With these caveats in mind, it is still possible to make some speculation about the seasonality of occupation. If it is assumed a) that despite their capability to do otherwise, most sheep are born in late spring (March-April), and b) that the age of maturation is somewhat closer to modern sheep than it is to Silver's (1969) semi-wild hill sheep; then it appears that most of the sheep were killed in the late spring or summer. If, on the other hand, the 18th century semi-wild sheep are a better analog, then an autumn or winter occupation is indicated.

Other domestic animals

The only other domestic animal represented in the faunal remains is *Equus* sp., either domestic horse (*E. caballus*) or ass (*E. asinus*). Included are an articulated section of a lower right hind limb (2nd, 3rd, and 4th metatarsals, and 3rd tarsal) and a mandible fragment still containing the fragmentary remains of the three premolars. The limb bones are from inside Hogan 15 (Quad 6 - fill above wall fall), while the mandible is from outside the same structure (Quad 1 - fill,). The remains are definitely not from a post-occupational 'walk-on,' inasmuch as knife marks suggestive of skinning were preserved on the shaft of the central metatarsal. The individual is apparently mature but is conspicuously smaller than most domestic horses. However, no diagnostic features which might indicate it as a burro are present, and the size is still within the rather wide range of *E. caballus*.

Other domestic animals (eg. dog, cat) are absent. However, it should be noted that a fair amount of carnivore gnawing of artiodactyl bones is present. While this may be from coyotes, it seems more likely to be indicative of the presence of dogs.

Large game animals

Deer, presumably mule deer (*Odocoileus* cf. *hemionus*), are the most abundant wild species and are seen in the remains at four different hogans. The majority of bones, however, are from a single structure - the fill of Hogan 8, Room 1. Here there are at least six individuals represented, mostly by metapodia and a few other limb bones. The metapodia have all been deliberately fractured, an activity which evidently took place within Room 1. It was possible to reconstruct several of the metapodia from a total of five or six fragments from each bone. Matching pieces were found connecting all quads of the room and both fill and floor designations. It appears then, that this bone fracturing and persumably final butchering activities took place in the room. The amount of garbage present is in excess of the quantity one would expect in living quarters, and is more characteristic of a dump.

The abundance of lower limb parts suggests that the animals were killed and initially butchered elsewhere. Accounts of Navajo butchering on both sheep (Binford and Bertram, 1977) and deer (Hill, 1938) indicated that the lower limbs are customarily left attached to the hides. In describing traditional Navajo deer procurement patterns, Hill (1938) notes that the metapodia are frequently the only elements introduced to the site. This pattern results when deer are skinned and initially butchered at the kill site. Some of the meat is eaten at the kill site, but the rest is jerked and returned to the habitation site wrapped in the hide with the metapodia attached.

At least part of the reason behind the fracturing of metapodia in Hogan 8, Room 1 may have been related to tool manufacturing. Some of the metapodia showed definite signs of having been longitudinally grooved, a technique designed to produce longer and narrower fragments with fracturing (as in classic Anasazi split metapodia awls). In addition, a few of the fragments, although not formally prepared tools, show definite signs of wear (polish). In conjunction with this is the observation that the only formally made artifact of mamalian bone is an awl from a split deer metatarsal (found in Hogan 4, Quad 7).

Although data are quite incomplete, it appears that the age structure varies considerably from that seen in the sheep-goat population. Examination of tooth eruption and wear, epiphyseal closure, and general size of the elements suggests that all of the deer taken are at least two years of age and some are clearly much older (using age criteria given by Gilbert, 1973).

Pronghorn (*Antilocapra americana*) are also present, but in much smaller amounts. The minimum number of three individuals listed in Table I is based upon only four specimens (mandibles, maxilla, and phalanges). Other pronghorn bones may be present, but is is probable that this species was of only minor importance here, or was butchered and consumed elsewhere.

Smaller fauna

Smaller animals appear to have been of little economic importance. Cottontails (*Sylvilagus* cf. *audobonii*) are the most abundant of these animals with a suggested minimum number of seven individuals represented. Some of these are most certainly post-occupational intrusives and it has not been established that any were utilized by the inhabitants for food. While it is probable that at least some were utilized, they still comprise only a very small fraction of the total meat present at the site.

Jackrabbit (*Lepus* cf. *californicus*) remains are limited to a few bones and probably two individuals, but do show better indications of having been utilized (bones are fractured, probably by human agents). In contrast, it seems unlikely that any of the rodents present, two wood rats (*Neotoma* sp.) and two kangaroo rats (*Dipodomys ordii*), were utilized. It is a possibility, however.

Artifacts

Five bone artifacts were recovered from 29 SJ 1613. Four of these were tubular beads manufactured from the two ulnae of a single medium-sized bird. The beads were made by simply removing the proximal and distal ends of the ulnae and cutting the shafts into two equal lengths. Species identification of the bird has not been made, but it appears to be a chicken-sized bird, perhaps a chicken itself. All of the beads were from Hogan 8, Quad 6: three from the floor, one from the fill. It is interesting to note that this is the structure with abundant deer remains.

The only formally prepared mammalian bone tool is an awl made from the right proximal posterior-lateral section of a mule deer metatarsal. This tool was recovered from the 'bone layer' of Hogan 4, Quad 7.

In addition to these formally prepared artifacts, slight indications of wear were noted on essentially unmodified bone fragments. Edges of some of the fractured deer long bones from Hogan 8 were examined microscopically and found to have small localized amounts of polish and unifacial scraping marks (tiny flakes removed) on some of the tips, projections, and sharp edges. This wear is probably from very limited use, perhaps in steps of skinning or butchering (hide scraping, etc.). It seems unlikely that such implements were used more than once or twice. More detailed (microscopic) examination of other long bone fragments would presumably reveal other instances of limited use.

Intra-site variability

The following is a very brief account of the extent and types of faunal remains present at each hogan unit. Hogans not listed yielded no faunal material.

Hogan 1—only a few bones present, mostly of a single infant rabbit. Only identifiable artiodactyl bone is a sheep metacarpal fragment.

Hogan 2—12 bones total, 11 are artiodactyl, probably from sheep-goat. The only non-artiodactyl bone is the femur of a kangaroo rat.

Pueblito 3—mostly artiodactyl remains but none have been firmly identified: one phalanx is probably sheep-goat. Small miscellaneous fragments are predominant. Quad 7 reveals small animals - one or two rabbits and a woodrat.

Hogan 4—there appears to be two large animals present—a deer and a goat. Bones of each were identified in various quads within the room and were found together in Quad 7. Only non-artiodactyl bone is a humerus from a kanagaroo rat.

Hogan 7—the ash heap contains two or more butchered sheep-goats, one of which is definitely a sheep. No non-artiodactyls and probably no non-domestics are present. The butchering is 'flagrant' and appears to have incorporated the use of an axe.

Hogan 8—Room 1 contains limb bones from at least six mule deer. The highest concentration is in Quad 7, floor contact, but matches with other quads and 'fill' proveniences suggest a rather extensive area for butchering activities. In the area outside Room 1, bones were recovered from only Quad 4 and here both deer and sheep-goat are present. In Room 2, again both deer and sheep-goat are present. The trash heap contains almost all sheep-goat but one deer element was also found. A suggestion can be made that the domestic animals were associated with the main occupation of Hogan 8 and the deer bones are largely derived from a short term reuse of the structure. *Lepus* and *Sylvilagus* are also both present in Room 1.

Hogan 9—essentially void of remains. Only two rabbit bones of questionable association and a few burned artiodactyl (sheep-goat?) bones are present.

Hogan 10—sheep-goats predominate with probably six individuals present altogether (most are from the ash heap). Both species are definitely present. One articulated deer lower hind limb and a few pronghorn bones were also recovered. Non-artiodactyls are relatively abundant with *Lepus, Sylvilagus,* and *Neotoma* represented.

Hogan 15—This is an interesting assemblage although rather small. At least three sheep-goats are present, all showing signs of butchering. One articulated pathological sheep elbow was found; the pathology apparently being exostosic growth in response to a fracture of the ulna. Deer, pronghorn, and horse (or burro) are also present in small amounts. No smaller fauna were recovered.

Hogan 17—only one bone was recovered, a burned ulna fragment, probably from a sheep.

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